



CHEETAL

JOURNAL OF

The Wild Life Preservation Society of India

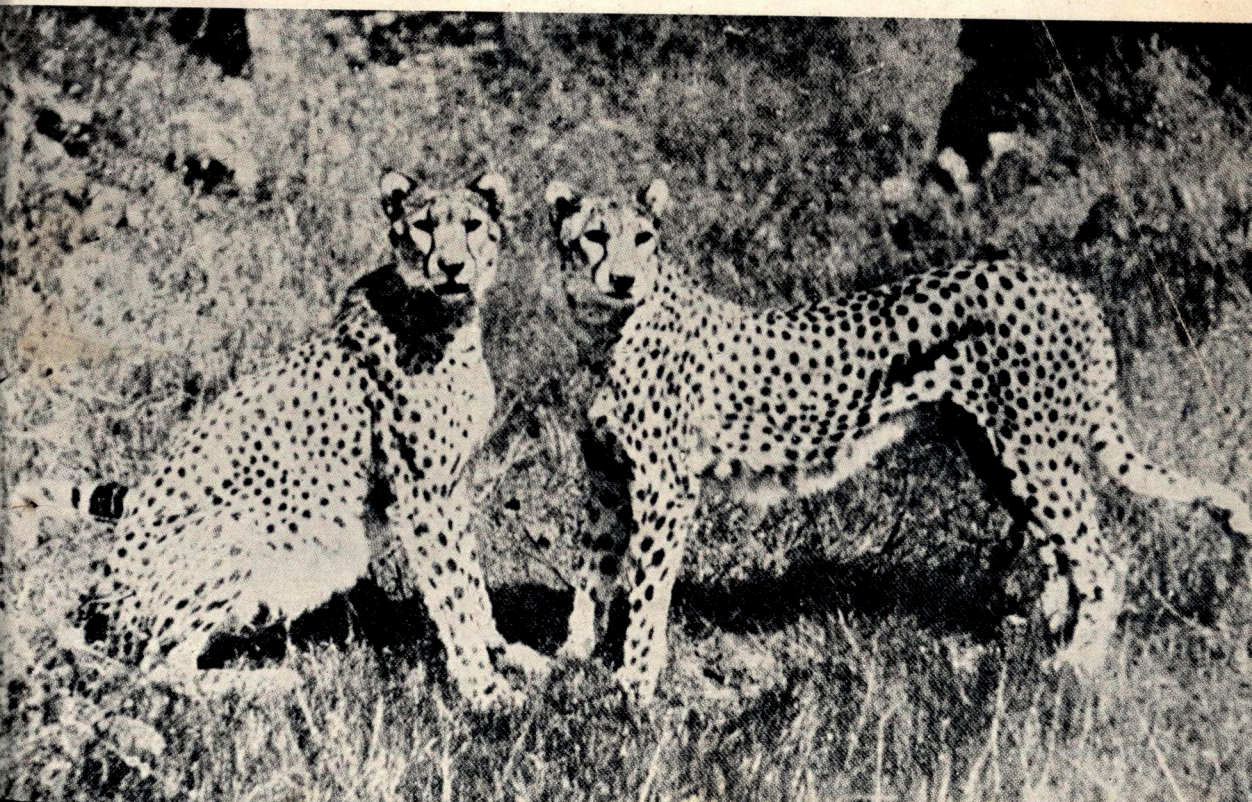
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No. 2

A PAIR OF WILD CHEETAS IN THE DECCAN JUNGLES.

—Photo by: Maharaja Kolhapur



Wild Life Preservation Society of India

1. The aims and objects of the Society are as follows:

- (a) To promote interest in and impart knowledge regarding the preservation and conservation of all forms of wild life, particularly among the youth of the country.
- (b) To co-operate with the Govts. of India and States and with other Societies and Institutions having similar aims and objects in working for the interests of wild life.
- (c) To assist in enforcing and actively supporting the Forest Acts, Wild Birds and Animals Protection Acts and Rules etc. of States and the Indian Arms Act and Rules in so far as they pertain to wild life and to bring to the notice of the authorities any infringement of the same and to assist in the detection and prosecution of offenders in respect of such laws.
- (d) To advise and help the Govt. and wild life administrators in the formation, maintenance and protection of Sanctuaries and National Parks, the preservation of wild life in general and rare species of India in particular and in the introduction of exotic species into the country, the rehabilitation of rare species etc. and in the revision on rational lines of the shooting and fishing rules, so as to conserve and increase wild life stocks.
- (e) To raise funds for the carrying out of the above aims and objects and to found and maintain museums, reading rooms and libraries of natural history in order to disseminate knowledge regarding wild life.
- (f) To promote sportsmanship in shikar and to recognise well regulated shooting and fishing, as a means of preserving wild life and fish so that through wise use the surplus may provide a recreational asset to the nation.
- (g) To carry out publicity and propaganda for the preservation of wild life in India by means of monographs, journals, films, film strips and other feasible methods.
- (h) To assist members of the Society in obtaining shooting and fishing facilities and facilities for viewing and photographing wild life in India.
- (i) To conduct research into the problem of Wild Life management in India, and in pursuance of this, to initiate, encourage and, where possible, assist in projects for the study of threatened species and related subjects and to provide reference and research facilities for such work.
- (j) To carry on such other activities which will serve the above subjects.

What membership of Wild Life Preservation Society of India will entitle you to ?

1. You will become an active member of the growing number of Wild Life enthusiasts, who enjoy working for and spreading the knowledge of how to conserve India's heritage of Wild Life for posterity.
2. You will be entitled to the full use of the Library of the Wild Life Preservation Society and of its reading room.
3. You will receive a membership certificate.
4. You will receive a personal Identification and Membership card.
5. You will be entitled to buy all publications of the Society at a concession rate.
6. You will be entitled to buy at concession rates the Society's Greeting Cards, Calendars, Tie, Lapel badge and the Balance of Nature Game (specially Published in colour for its educative and recreational value).
7. You will be supplied "Cheetal", the half yearly journal of the Society free.

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Ourselves

The year nineteen hundred and sixty nine will go down in Indian Conservation History as the turning-point. Not only was the Indian Board for Wild Life re-constituted and re-vitalised in that summer, but also the Tenth General Assembly of the I.U.C.N. met in New Delhi in November at Vigyan Bhavan. Both events have a significance beyond all calculation for the good of India's natural resources.

Living and working now in the young harvest of these constructive moves, we at 7, Astley Hall feel satisfied at having contributed our share towards making the most of these opportunities for the advancement of conservation and of the Society and its Journal, CHEETAL.

Our office-bearers assisted at the deliberations of these meetings and conferences, and continue to render yeoman honorary service to the Cause. The Special Issue of CHEETAL last November was extremely well-received, and we publish elsewhere some of the comments of a readership which included conservationists and ecologists from all over the world.

This, the twenty-fourth issue of CHEETAL is, naturally, more modest in size and coverage. Our long-standing plan to convert CHEETAL to quarterly publication still waits upon the availability of resources, which only a larger membership or a substantial subsidy can procure.

Having lost in the last two years the valued guidance and counsel of two members of our Editorial Board, the late Sri M.D. Chaturvedi, and the late Dr. Bainsi Pershad, we were sorely deprived, and are happy that Dr. S.K. Sangal and Sri K.C. Sahni have agreed to serve on the editorial board of CHEETAL.

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The Society continues to function effectively, and many more new members have joined it, and for this the honorary office-bearers deserve our gratitude. CHEETAL is the result of their dedicated efforts, and we appeal to our members all over the world to consider themselves part of the team. It is only their efforts that can increase our circulation, and improve the quality of our material. In this year of conservation-minded governments and organisations, we remain more than ever optimistic that the day is not far when every issue of CHEETAL will be as good as we tried to make the last issue. This current issue is our earnest of this faith.

Editorial Notes:

THE I.U.C.N. CONFERENCE, NEW DELHI:

Though we publish a fuller reportage elsewhere of this historic General Assembly meeting, some sidelights might be interesting here.

Gathered together in the imposing hall of Vigyan Bhavan were conservation luminaries of the much-plundered planet, Earth. To name some and not to mention others would be controversial in any other field of human endeavour, but conservationists generally shun personal publicity, so it might be permissible to mention the well-loved figures who graced the occasion. There was the gentle son of the heroic father, Peter Scott, whose water-fowl water-colours grace the homes and calendars of people all over the world, and who is Chairman of I.U.C.N.'s Survival Service Commission. Professor Banikov from the U.S.S.R. lent the immense weight of his professional and physical presence to the deliberations. Dr. Coolidge, the President of the I.U.C.N., was the visible personification of an organisation devoted to humanism and the finest values of human and natural life. Sir Hugh Elliot, one-time civil servant was no stranger to India, nor were the younger and more active field workers Dr. Schaller and Juan Spillett, and a host of other personalities with one or other specialisation. From India, Mr. R.C. Soni, the Inspector General of Forests, ably hosted the Conference, and enlisted the blessings and full support for this most important work of such public eminences as the Prime Minister herself, and the Chairman of the Indian Board for Wild Life, Dr. Karan Singh. Our own President, H.H. Nabha, was, of course, whole-hearted in his help, assisted notably by the Vice-President Mr. Negi, and the Honorary Secretary, Dr. Misra.

All in all, it was a most useful congregation of the people on whom the world of the wilderness must rely for succour in the next decade. Most heartening was the large attendance of forest officers and zoologists from all over India who made the gathering and the discussions such a success.

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THE BIG CATS:

It was encouraging to hear of the success of the experiments conducted by Joy Adamson and her wildlife-expert husband in breeding the cheetah and other large felines in controlled conditions in Africa, and their equally successful release and rehabilitation into areas from where they have vanished through excessive hunting pressure. This holds out great hope for similar aspirations in India, voiced by some of our zoo-men. Before long, given resources, it might be possible to re-introduce the Indian cheetah, now extinct in the wild state, though still held by some in captivity, into areas of its past range. We might be able to begin with introductions in a good sanctuary in Rajasthan or Gujarat. This possibility needs to be studied

by our zoologists and zoo-directors. Thirty-three year old Mr. P.M. Olindo, who is Director of Kenya's National Parks, feels it will work.

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THE I.B.W.L.:

Making up for long years of sedate activity, the 'new' I.B.W.L., with its official underpinning in the wildlife 'cell' created in the Department of Agriculture, has set a tempo of work and field activity which bids fair to becoming a genuine example of what such bodies can achieve. In the last ten months or less of its existence, since the meeting in July, 1969, not only have there been meetings of the Executive Committee every few months, but the Expert Committee formed under the IBWL's advice, has undertaken an extensive tour of India's wildlife areas for assessing the most urgent needs. It is too early yet to pass a judgement on this work, but to many observers it seems as though there is little likelihood of neglect from official quarters at the Centre or even in most States of this long-neglected field of effort.

The much-argued ban on the shooting of tigers all over India for a period of five or fewer years is also making headway, and only three States have yet to declare their intention of imposing such a ban from this summer onwards. It seems likely that this season now ending is likely to be the last in which 'shikaris' with permits can hope to shoot tigers. Whether poaching can also be suppressed is subject to the efficiency of implementation, but the intentions and the determination of governments seem to be for once beyond reasonable doubt or criticism.

Mule Safari to the Semien Mountains of Ethiopia in Search of the Walia Ibex

By

MALCOLM LYELL

We were invited to visit Ethiopia by His Highness Dejasmatch Assefate Kassa, who is Governor General of Eritrea. Prince Kassa is head of the Royal House of Shoa and prior to his appointment as Viceroy of Eritrea in January, 1964, had been President of the Senate in Addis Ababa. It was he who arranged our mule caravan to travel in the Semien Mountains in April, 1964, and who obtained permission from H.I.M. The Emperor for us to shoot a Walia.

When Prince Kassa invited us to go to Semien, I imagined that the Walia, or Abyssinian Ibex, was a relatively common animal with a small range and was mainly protected by its inaccessibility. I had read the two recorded accounts by Englishmen of hunting expeditions in this area and imagined that, like most Ibex, it lived in areas far from human habitation and that perhaps its only enemies were leopards and an occasional sportsman.

When we were in Nairobi, prior to going to Ethiopia, we met by sheer chance one of the two Englishmen who has been in Semien since 1924. He was Leslie Brown, the well known naturalist, who made the journey to Semien in October, 1963, to make a survey of the Walia. It was he and our personal experiences that dispelled my misconceptions about the numbers of Walia in existence today on Semien.

The Walia Ibex (*Capra Walie*) was first recorded in 1835 by the Austrian naturalist Ruppell, but present day knowledge of the Walia is based mainly on the writings and records made by Major P.H.G. Powell-Cotton, F.R.G.S., F.Z.S., who visited Semien over sixty years ago and by Major H.C. Maydon (formerly in 12th Lancers and Egyptian Army) and Colonel G. Blaine, when they went there in 1923.

Our expedition to Semien started from Asmara, the capital of Eritrea, and Mr. John Bromley, the British Consul in Asmara and his wife accompanied us. On our way south we visited Axum, which is said to have been the Queen of Sheba's capital city. According to Ethiopian history, one of the country's earliest rulers was Queen Makeda who, as the sovereign of the rich and powerful Kingdom of Axum (which included the greater part of northern Ethiopia and the Yemen), set forth from this capital on her visit to King Solomon.

Due to the enthusiasm of the present young and energetic Governor of Tigre Province, His Highness Prince Mengasha Seyoum, one of the palaces of the Kings of Axum is now being excavated. It lies on high ground on the north side of the town with a vast panorama to the north—towards the arid hills of Eritrea.

Axum is one of the great religious shrines of Ethiopia. There are the remains of a Christian church, said to date back to 340 A.D., and next to it stands the church of St. Mary, built by the Emperor Fasil in 1665, where the crowns of the Emperors of Ethiopia are kept. No woman is allowed to enter the church and the crowns were brought out one by one from the vestment room for my wife to see from behind railings. There is also a huge collection of brilliantly coloured vestments and an even more brilliantly coloured collection of umbrellas—I counted over 150. In the same room there are boxes filled with silver and iron crosses, ancient leather-bound books, as well as an ornate set of harness labelled "H.I.M. The Emperor Haile Selasse".

But, most impressive of all things at Axum are the mysterious granite obelisks, whose origin is lost in antiquity. A number still stand, but the majority have been pulled down and lie broken on the ground. Some are finely carved and others are just smoothed pinnacles of stone.

It is at Axum that one has the first glimpses of the great Semien plateau, with the peaks that rise from it, and even at a distance of 70 or 80 miles it looks awe inspiring.

The country south of Axum is flat and easy going, broken by small hills and deep ravines. There are few trees, except for thorn scrub, until one starts the 3,000 feet descent into the hot and thickly wooded valley of the Tacasse. We stopped for lunch by the river and made a plan to try and camp there on the way back to photograph the many beautiful birds.

After crossing the Tacasse and when one has reached the top of the hills to the south of the river it is only 30 miles as the crow flies to the northern escarpment of Semien. The great precipices can be clearly seen and from the ground below rise huge pinnacles and buttresses of rock, like sentinels guarding the approaches. Later, looking from the top of the Semien escarpment, they looked quite small.

The road up to the east side of the Semien plateau is one of the greatest feats of road building in the world. One is constantly told of the great loss of both Ethiopian and Italian lives when it was built during the Italian occupation. The road was built to link Gondar with Asmara and then with Massawa, so as to carry the grain to the coast from the great corn growing areas around Gondar.

For the last hour of the journey to the top of the plateau the road literally snakes its way along the contours of the Pass of Wolkefit in hair-pin bend after hair-pin bend, until one eventually reaches the top of the plateau—at a height of about 10,000 feet. It is then only a few miles to the town of Devarik, which has usually been used as the starting off place for the journey to the Walia ground.

We were met at Devarik by the Governor—Grasmach Mercha—to whom we presented our letter of introduction. It was he who had prepared our caravan, which consisted of 19 mules and horses and a party of 15 men, guides, muleteers and police. In addition, we had our

original police escort of an officer, a corporal and a policeman, as well as a cook and interpreter.

There were the usual difficulties of setting out on an expedition of this sort. Were there enough mules? Had such and such a thing been packed and, if so, where was it? Which were the best riding mules and horses? Then there were so many people watching or appearing to be doing things that it was difficult to know who was a member of the caravan and who was not. It seemed as if the whole town had turned out to see us go and it was not until we were clear of the outskirts that one could take stock of the position and see exactly who were our new found companions. There was a rough and ready order in the long procession and we soon found how hard it was to keep the caravan together. The baggage mules either got left behind or else were miles in front. Generally they were behind because the loads had slipped. The armed guards were dispersed along the line. Those on foot carried their rifles across the back of the neck with one hand clinging to the muzzle and the other to the butt of the rifle. Some porters carried tent poles and made use of them by slinging live chickens by the legs at either end of the pole.

It was about an hour after we left Devarik that a man rode up on a grey pony who was to become my friend, guide and constant companion and who later accompanied us back to Asmara and to the Red Sea hills. He had a friendly and kind face and wore a coloured towel wrapped, turban style, around his head. His name was Irga Alleymayou and we discovered that he was a merchant in Devarik. We never quite knew whether he came by chance, or whether he had been instructed by the Governor. I suspect it was the latter and that he was just a little late. Anyhow, from the moment that he joined us he seldom left my side.

At this stage it is worthwhile for the reader to look at the map. It will be seen that the route to the escarpment runs in a north-easterly direction, at an average height of about 10,000 feet. The march to our first camp near Addis Gey took us through a variety of country—pleasant grassy downs, intersected by steep valleys. Small villages are scattered here and there, with cultivation around them. The houses or tukuls are largely built of brush-wood (Bush-Hypericum or giant heather) and either singly or in groups are surrounded by a brush-wood fence. On this first day we saw the Giant Lobelias (*Lobelia rhyncho-petalum*) for the first time. Later they were to become a familiar sight to us on the higher parts of the plateau. We saw them in all their phases—ranging from the young plants which had not flowered and which were between 3 and 10 feet high, to the older plants with their huge inflorescences, which rose to as much as 20 to 25 feet.

Walking or riding slowly along the tracks one had plenty of time to see and note the things which were so different. It was the plants especially which impressed us—either it was the “giants” or else it was the plants which in Europe one looked upon as something special

to grow. The "giants" were the heather, up to 35 feet high, the Echinops (thistles) up to 9 feet high, and the Hypericum up to 20 feet high. The "something one grew in Europe" were the yellow jasmines (*J. abyssinicum*) and white roses (*R. abyssinicum*) which we brushed by along the narrow mule tracks.

In the morning of the second day we came to the high precipices of Semien, where we skirted the edge of the Serecaca gorge and where the baggage mules had to be unladen in case their loads were to buffet them off the narrow track down into the steep ravine below.

In the afternoon that day we reached the Abyss—or so it was described by Maydon after he had been there in 1923—which is like a huge bowl, cut out of the plateau, with great precipices reaching down for 5,000 and 6,000 feet to the valleys below. On the far side we could see a small river which poured over the edge and disappeared in fine spray a thousand feet below.

It was here that we saw our first Gelada baboons—a species only found in the high mountains of northern Ethiopia. At first sight you think you are looking at a lion when you see a large male Gelada with his large mane and tufted tail. Later, these monkeys were to become an accepted part of the daily sights on the Semien, and one day while we were sitting on the top of the escarpment at Mietgogo eating some lunch a troop came up from the precipices which numbered more than 500.

Later we reached the river, which disappeared in spray into the Abyss, and wished we could make a camp beside it. But there was hardly enough flat ground for our large party to camp and in any case our guides pressed us to go on up to the village called Geech on the hillside above. So we rode on but when we arrived at the village the baggage mules were nowhere to be seen. They arrived an hour later, having thought that we were going to a different place.

The camp at Geech (11,000 feet) was far from ideal. It was bare and exposed and any sort of privacy was out of the question. We pitched camp there because the muleteers, the guides and the police advised us to do so. They said that the villagers would provide us with adequate firewood and water. We were rather doubtful but in the end, however, it turned out for the best because we were able to reach the main Walia haunts within half to two hours by mule.

We were told that the chief of the district was coming to join us and that it would be advisable to await his arrival before we looked for Walia. So our first day was spent walking in the pretty valley below our camp.

On the second day at Geech, the man for whom we were waiting arrived. His name was Nadow Wareta and he was known as the Chambel (which means Captain). He rode into our camp on a fine riding mule with a richly caparisoned saddle, and with a group of retainers running at heel. That evening, outside our tents, I spoke to the Chambel and our guides,

and told them what our object was—that we had come to Semien to count the Walia, photograph them, and to shoot a mature male if we saw one. I was anxious that they should know from the start exactly what our aims were—especially because I was becoming aware that to them any Walia was a shootable Walia.

From then on we settled into a daily routine. The day began at about 5.0 a.m. when our muleteers and guides began to stir—mainly because they were too cold to go on sleeping. The fires were lit and the dawn began to break at about 5.30 a.m. but it was always difficult to get our party under way quickly enough. I made it an object to be down over the edge of the escarpment by the time the sun rose and before the Walia started feeding, but it was difficult to achieve. Either there were not sufficient mules saddled up or else Alleymayou or someone else had disappeared.

Another difficulty we found was that because we were the guests of the government, we were to some extent in the hands of the Chambel and, therefore, not able to make our own plans—at least to start with. We found that all plans and routes were clouded in mystery and that exact information was difficult to obtain. No two people would ever give the same answer as to how long it took to get to a place and no one could ever be ready on time.

As we became more familiar with the area, we became more independent of the Chambel and our guides. We came to make our own decisions as to where we were going and what we were going to do and, furthermore, if people were not ready on time, we left without them.

Then there was the question of how many people came with us each day. To begin with, we found that almost everybody came, which was quite hopeless, and the Chambel ought to have realised this, but he did not. As the days went by we gradually reduced the size of the party, until eventually my wife and I never went down over the escarpment with more than Alleymayou, the police Lieutenant Hagos and a man from Ambarass, called Alem Borgale, who was a retainer of the Chambel and who turned out to be a first-class tracker. With this group, my wife and I were able to cover the ground and spy the escarpments silently and unobtrusively.

The feeding habits of the Walia seem to vary considerably, and this is probably due to the time that it takes for the sun to shine down on the many faces of the escarpment. On two occasions I saw them feeding between 11.0 a.m. and noon, and once at Mietgogo as my wife and I were eating lunch we saw a female feeding at 1.0 p.m. However, most of the Walia which we sighted feeding were seen between 7.30 and 11.0 in the morning and then again in the evening. As well as grazing on the grass, which at the time of year we were there was brown and dry, we watched them browsing on the giant heather and on occasions standing on their hind legs to do so.

If they are grazing in the open on the pale dry grass they are easily spotted. The females and young males are a dark grey colour and their white underbellies and the delightful large white spot on their kness make them relatively easy to see—especially when the sun is on them. But in the shade and against the dark, volcanic rocks they are excellently camouflaged and difficult to pick up, unless they move. When alarmed they often made for the cover of heather forest if it was nearby or else galloped off along the inaccessible precipices until they were out of sight.

One morning, at 10.0 o'clock, we saw a delightful sight. We had been sitting on a ledge for some time watching a young $2/3$ year old Walia browsing on the giant heather some 500 feet below us and we were just about to start filming him when suddenly we realised that a baby male Ibex was sitting level with us on a ledge 30 ft. away. He was probably 5 or 6 months old, and was lying on a rock in the shade of a giant heather. We lay still and watched him quietly chewing the cud for five or ten minutes. I was quite certain that the click of the still camera, or the whirr of the cine-camera, would frighten him off the moment one started to film him but when we did so he appeared not to hear the noise in spite of it being a still day. I was able to use up all the film I had with me at the time but he was in partial shade and the results were not what one hoped. After this, I sent two men who were with me to try and get above him in the hope of trying to lasso him, but as they gently came down on to him he took fright and leapt over the edge of the precipice and we watched him bound from rock to rock down a narrow gulley, and then disappear under the overhanging rocks below.

On our first day on the escarpment at a place exactly to the west of our camp, we saw one of the only two mature male Walia in our 10 days in Semien. We had left our camp late—at 7.15 a.m.—and had started the descent of the escarpment at 8.15 a.m., and by 9.30 a.m. saw our first Walia across a ravine—a herd of 8 females, 3 kids and 2 young males.

We were in thick heather scrub—trees of about 20 ft. high—and were making our way along the edge of a precipice, clinging from tree to tree. From the edge of the scrub to the edge of the precipice was perhaps 20 ft. of slippery dry grass, and the ground was very steep—so steep that one had to hang on to the trees for safety. Alleymayou and another guide called Dikou, who had my rifle, were edging their way along, right on the lip of the precipice, when they both suddenly lay quite still. From the look on their faces and their mounting excitement I was certain that they had seen an old male. They beckoned me to come down to the edge, but I couldn't bring myself to let go of the giant heather. I lost precious minutes before I plucked up enough courage to crawl down half the intervening width of dry grass. I slowly stood up and there below us I saw a magnificent male Walia. He was walking quietly along towards us about 1,000 ft. below on a broad ledge of grass. The sun was shining down on to his dark chestnut brown back and his huge sweeping horns looked magnificent; but in spite of all this I still hadn't the nerve to go to the edge for a

shot, and so it was that he walked out of sight under the ledges below us, and we never saw him again. It had been a thrilling few minutes, and it was exciting to know that there was an old male about. Even at the distance that he was below us one could clearly see through binoculars the massiveness of a mature male Walia's horns. His heavy body and long coat were, also, particularly noticeable, although at the angle at which we saw him one could not see the bony prominence on the forehead which is one of the features of the Walia.

It is easy to be wise after the event, but I dare say that if the same scene had been enacted a few days later we might have shot him—for by that time we always carried rope and had become more accustomed to looking over the great rock walls. He was at about 9,000 ft., and by this time the sun was so hot that we felt that any further chance of seeing Walia was unlikely until the evening. So we made our way back up to the top of the plateau and home to camp.

In the evening of that day the Chambel had gone out to spy the escarpment, and later one of his retainers came running into camp to report three more Walia seen. I ran off with him, and over the brow of the hill above the camp found another retainer holding the Chambel's mule, which I mounted and rode to the escarpment, but the Walia had gone by the time I got there. However, it was nice to ride his fine mule—which was so different to even the best of the riding mules of our caravan. In Ethiopia a good riding mule is a prized possession, and an expensive one. We had seen many lordly Amharas on the road between Devarik and Gondar riding such animals and it was exciting to be on one.

The succeeding days on the escarpment followed the same routine, although it was a week later before we saw another mature male. The hours we spent on these precipices were always exciting. There were the Lammergeyers which planed like gliders through the still air below us, and sometimes we saw Choughs; but it was the Semien crows that excited our curiosity, with the extraordinary white patch of feathers behind their eyes—which looked almost like our muffs.

Every day we saw Klip-springer. Unlike the Walia, they were very alert and spotted one very quickly.

We only once saw the so-called Semien Wolf—(*Simenia simensis simensis*). This was one early morning near Geech when two crossed in front of us about 50 yards away. This animal has been variously described as the Red Wolf of Semien, the Semien Dog and the Abyssinian Wolf. In colour, they are very similar to an English fox, and they have a thick black brush. They stand high on the leg, and resemble a mixture between a fox and a jackal. Their coat is moderately long and silky. The local people say they are generally found singly or in pairs, but that occasionally up to four are seen together. Mr. Brown saw what he believed to be the droppings of these animals and found them to contain the remains of small rodents—probably the Semien rat, whose burrows we frequently came

across. Little is known about the Semien Wolf, but it is reported to be fairly common throughout the highlands of Ethiopia. The local people of Semien said that they were quite numerous, and although one man said they attacked sheep, the general opinion seemed to be that they did little harm.

How many Walia are there, and to what extent have they declined in—say—the past 60 years? It is impossible to tell what the maximum population has ever been. All one does know is that as recently as 1938, an Italian that I know in Asmara went there and shot a mature male the morning after he left Devarik, and describes seeing herds of 40—probably near Addis Gey or on the Serecaca precipices. Our guide, Alleymayou, and the local people talked of them being “as common as sheep before the Italian occupation”, and blame the Italians for their decline, but this is obviously ridiculous because the Italian occupation ended over 25 years ago, which would have given plenty of time for the Walia to regain their numbers.

Alas, neither Powell-Cotton or Maydon give an estimate of their numbers, but from what they have written, it is obvious that when they were there, the population was not numerous. Both of them refer to the human menace and the cultivation on top and below the escarpment. Powell-Cotton was especially aware of the dangers for he wrote in 1902, the year after he had been there, “the natives hunt these animals, persistently, for their flesh, skins and horns (which they use for tumblers), and now that they are so much better armed, I believe in a very few years the animals will be extinct.” More than 60 years have gone by since he wrote those words, and the Walia are still there, and may be in 1964, Leslie Brown is right when he says that “it may be beyond the wit of man to exterminate the animal in its dizzy haunt”.

It is also probable that the Walia were most numerous on the Geech/Mietgogo stretch of the escarpment which is the part which we studied so carefully. The earlier travellers refer to them on Ras Dedjen, Bwahit and Beyedda, but it was at Geech and Mietgogo that they saw the most—and shot their trophies. Today, it is certain that they are almost exterminated in the north east part of the Semien. The ground in these places is so much easier to cover, and with the herdsmen so near to the Ibex, there is little chance for them to survive.

From what the local people say, it seems likely that these areas have been cultivated and the local people have grazed their livestock on Semien for hundreds of years, but there is no doubt that the human population has greatly increased in the last 30 to 40 years.

Among the local people of Semien a certain aura surrounds the Walia. Whilst the Klip-springer goes almost unmolested, the Walia, even a female, seems a prize. There is no need for the locals to shoot them, for they have plenty of meat. Nor do the horns of a male Walia head command a particularly high price.

Only the Emperor may give permission to shoot a Walia, and since the end of the war only a very few permits have been given. This, no doubt, enhances the aura of the Walia in the eyes of the local people. There is really no-one on the plateau who can stop the local people shooting—or would know if one was shot—and no-one cares whether it is a female or a male.

We saw the horns of a large male Walia in the markets at Addis Ababa and Asmara, and Gondar market probably has them, too. They are sold as souvenirs, probably to people who haven't the faintest idea what they are. In days gone by they were used and sold as drinking vessels.

Powell-Cotton, in his book "Sporting Trip Through Abyssinia" (Rowland Ward 1902), gives a comparatively brief account of his Semien journey. He was in Semien for eight days from 23rd June to 1st July, 1900, and in this period he records a total of 22 Walia of which 5 were mature males.

Maydon and Blaine spent six weeks in Semien—i.e., all February and the first half of March of 1923, and Maydon gives a very detailed account of what he saw. He refers to 62 specific Walia of which six were mature males, but he also mentions many herds seen by himself and by Blaine.

In ten days at the end of October and the beginning of November, 1963, Mr. Leslie Brown saw 34 separate Walia, and in the same time in April, 1964, my wife and I counted 42, of which 12 may well have been counted twice. We were more fortunate than Mr. Brown in that we saw two fine mature males. Mr. Brown estimates that there are between 150 and 200 in existence, but he has returned this spring to do an eight week study of them when he may be able to make a more accurate assessment of their numbers.

There is an adequate breeding stock of young males and females. In fact, it was rather remarkable that we saw so many of them and so few old males. But to be certain of the survival of the species game guards should be installed in the area and, ideally, the local population both below and above the escarpment should be moved to other areas. The latter is by far the most difficult to carry out but it is just as essential as the appointment of game wardens, for as long as there are people living so close to the escarpment one can never stop the cutting down of trees on the escarpment for firewood which are vitally important for food, cover and protection of the Walia.

If these measures are carried out it will be only a matter of five years or so before the Ethiopian Government can begin to recoup the costs of preservation by charging licence fees for restricted shooting.

That it was possible for my wife and I to visit Semien was entirely due to the kindness of Prince Assefate Kassa and to him we owe the greatest debt of gratitude. But in addition we received great help from many friendly Ethiopian people whom we met on our travels. It

is invidious to single out particular people—especially when everyone was so helpful—but we are greatly indebted to the Governor of Devarik who provided us with our mule caravan and guides. For more modern transport, we thank Trans World Airlines and Ethiopian Air Lines who transported us so swiftly and comfortably from London to Ethiopia.

And finally—the Bromleys. No-one could have wished for more congenial companions. They had been stationed for many years at Mega in Southern Ethiopia and no-one enjoys the solitude of the wild places of the world more than they. Their knowledge and experience was of inestimable value to us and we were so pleased to be able to share with them the fears, excitements and tensions of stalking the Walia on the great precipices of the High Semien.

August 1964.

Footnote by Malcolm Lyell, September 1969

Since this account was written in 1964 much has happened in Semien, and world interest has been centred on the Walia Ibex.

The World Wildlife Organisation and the Ethiopian Government have been taking steps to give complete protection to the Walia. The Ethiopian Game Department has been formed, with Major John Blower (former head of the Uganda Game Department) as the chief advisor to the game department. A Game Warden has been posted to Semien, and Mr. John Bromley is temporary game warden there now. Plans have been drawn up to create a part of the Semien escarpment as a National Park, and a road for jeeps and landrovers is being built from Devarik to Geech. Furthermore, more detailed surveys and counts indicate that the estimates made by Leslie Brown five years ago are not far out, and that only about 200 of these animals exist.

Probably the top of the Semien escarpments will soon be trodden by tourists who will be staying at modern lodges at Geech. Then the romantic and exciting remoteness of the region will have gone for ever, but the preservation of this magnificent goat will be assured and the views down the escarpment and across the hills below will remain as breathtaking as when the former travellers, including myself, saw them.

The Detrimental Effects on Wildlife of the Crop Protection Guns in North Eastern Assam

By

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I am prompted to write this note after a number of years in Upper Assam as a Tea Planter and Sportsman with an interest in Wildlife Preservation and having considerable personal experience of the terrible toll in death and suffering taken of wild animals and birds by the so-called 'Crop Protection Gun' in these areas.

One reads in 'CHEETAL' and other such publications of the genuine efforts towards preservation of many dedicated people, both official and otherwise, but it is with a sense of frustration and disappointment that one can see whilst moving about the local forests, the decimation of wild animals and birds that continues almost with impunity. An even greater effort must be made by all, but in particular by those in authority, and one of the ways of doing this, unpopular though it would almost certainly be, is to control more strictly the granting of crop protection licences and to enforce more stringently the laws governing the use of guns held under such licences. The idea of the crop protection gun, as such, is basically a good one as at least one cannot fail to appreciate the feelings of the villager who, after considerable hard work and expense, wakes up to find his crops flattened by elephants or wild buffalo. A stricter control of the crop protection gun and its use is called for, particularly in Assam, which as yet can still boast of considerable expanses of relatively unspoiled forest and the resultant wide variety of wildlife. Also, as this extreme corner of the country contains many villages bordering forest areas in which dwell persons who both understand the forests and the ways of its denizens and possess crop protection guns, regrettably however seldom used for this purpose.

Since 1962 when the local village people of this area, and I'm sure this must also apply in other regions, became increasingly aware of the real need to cultivate more intensively both for their own and the country's benefit, large expanses of land not previously cultivated have been cleared for crops. Land under forest in North Eastern Assam falls roughly into two categories, firstly that covered by primary or secondary growths, a majority of which now lies within the boundaries of classified state forests. Secondly that covered by vast reed beds, some of which falls within classified forest boundaries, but much of which borders these forests and as such is unclassified and available for cultivation. Deep within these latter areas were once to be found both permanent and seasonal jheels well populated by wildfowl but now cleared, partially drained and cultivated. It is the latter of these two types of country, the relatively easily cleared reed beds that has suffered most. There are also large areas of land within classified forests that have been badly encroached despite the efforts of the extremely hardpressed Forest Department.

The people mainly responsible for this clearing are ex-Tea Garden workers, landless people from lower down the Brahmaputra Valley and to a certain extent Plains Tribal forest villagers who occasionally move into land cleared, temporarily cultivated and then abandoned by the former groups. Many of the ex-Tea Garden inhabitants have spent years living either as workers or dependants on the nearby tea estates, such dependants have been up to quite recently almost guaranteed seasonal temporary employment. Now as conditions change and the possibility of such employment becomes increasingly doubtful, large numbers of them have decided that to cultivate their own plot of land is infinitely less of a risk than awaiting employment that may never materialise. This category of cultivator knows very little and cares even less for forest boundaries and although those who do encroach into reserves are ultimately evicted, many return later.

As already mentioned much of the land cleared is unclassified village land once covered by reed beds and often bordering reserved forests. Nevertheless these vast areas formed natural buffer zones between forests and village cultivations and constituted a large and important part of the habitat of many species and their clearance has robbed a large variety of animals and birds of important shelter and feeding areas. Once cleared, crops are planted and dwellings constructed and quite naturally it is not very long before animals are finding their way out of the forests to feed in the now easily accessible cultivations. Until quite recently people living in established forest perimeter villages expected a certain amount of damage by wild animals, mainly elephant and buffalo. But now with cultivations developing rapidly and villages springing up to the very edges and even into reserved forests, damage by wild animals has increased considerably and the crop protection gun kills and wounds many more animals than is officially known or recognised. The regrettable fact of this is that although the crop protection gun is possibly used as such much more than previously, only a small proportions of the killings and woundings are perpetrated whilst using the gun for its declared purpose. The normal procedure in most villages of this area when suffering from the unwelcome attentions of marauding wild animals is to utilise the village defence organisations and young men to patrol and guard the cultivations at night. Methods used in these guarding operations to scare away animals, all being in my experience very effective, are fires, fireworks and drums, and quite often the mere presence of people serves to frighten the animals back to the forests.

The great majority of killings and woundings occur as a direct result of the fact that there are now considerably more people living and cultivating in the immediate vicinity of reserved forests, and as such there has been a corresponding increase in the numbers of so called 'shikaris' who are only too willing to use their guns, originally granted in good faith for the purpose of crop protection or to hire them out for the purpose of poaching deer and buffalo inside reserved forests. This latter I regret is the use to which the crop protection

gun is most frequently put. Many of the reserved forests in North Eastern Assam cover very large areas and are not in a number of cases readily accessible and the poacher has little difficulty in eluding the hard pressed and all too often office bound forester. The risk of being caught is small and well worth taking to the poacher who finds a ready and most lucrative market for his meat in the local bazaars and tea gardens.

It would seem nowadays that it is in fact very difficult for a villager to obtain a licence to purchase a gun, but the damage is now being done not necessarily by newly granted guns but by weapons that have been in the villages for many years, the condition of some of which must be seen to be believed. There is no control whatsoever on where and how these guns are used and I know of one Class I Reserved Forest from which regularly during the dry season a number of Sambhar are poached and sold. This I regret is not an isolated case! The Swamp Deer of which such care is taken in the Kaziranga Sanctuary is to be found in small numbers in the Dibang River locality of Lakhimpur District and had the extensive killing of them not reduced their already small numbers to their present precarious level I am sure an effective breeding population could have been established and maintained in what is a most suitable area. The areas bordering the Dibang River are now being rapidly opened up as villages and cultivations and at the beginning of the 'dark period' preceding each new moon 'shikaris' from these nearby areas may be seen on elephants and in boats, heading upstream for their favourite hunting grounds. In this area where once were to be seen without too much difficulty Sambhar, Barking Deer, Swamp Deer, Pig, Elephant and Buffalo, only the latter exist now in any appreciable numbers. The White Winged Wood Duck, subject of the efforts of Mr. M.J.S. Mackenzie and The World Wildlife Fund Project 406, the Working Group of which I am privileged to be a member, is to the local gunmen regrettably just another prospective meal if encountered in the forests.

I could quote many personal experiences which would serve to illustrate my remarks and to typify the use to which the Crop Protection Gun is very often put, but the following three instances should suffice.

The local villagers dwelling on the fringes of the nearby Class I forest own considerable numbers of domestic buffalo that are grazed in and around the reserve. At certain times of the year solitary wild bull buffaloes leave the jungle and join the village herds and in all fairness it should be said that under certain circumstances these animals are troublesome. Nevertheless the local buffalo owners rely entirely on these wild bulls as sires to their domestic cows for the simple reason that experience has taught them that any domestic bull encountered by the wild one will certainly be killed. It is not surprising that under these circumstances the wild bull is loath to be driven away when his usefulness is deemed to be over. It is at such times that the crop protection gun is brought into use, more often than not firing refilled cartridges containing powder extracted from fireworks and assorted metal that merely

wounds the animal unfortunate enough to be fired at. An old wild bull buffalo such as described above had killed a man and wounded another in this area in 1966 and I was requested to destroy it. After obtaining the necessary permission I succeeded in doing this after a number of fruitless stalks, over a number of days, through thick 'kuggeree'. The bull proved to be rather thin and out of condition which is very rare in this area that is so ideal for the buffalo either domestic or wild; on examination I found that the whole of the nose and mouth had been shattered by assorted shot and the face so badly disfigured that feeding must have proven extremely difficult, this injury obviously accounting for the poor condition of the animal. A local gun owner proudly announced that he had fired these crippling shots some nine months previously when the bull had been reluctant to leave an 'in season' cow one night at a jungle edge buffalo camp.

In 1967 I was called upon to kill a tiger that had taken to attacking human beings and had killed two persons and injured one in a nearby village. I succeeded in destroying this animal, an elderly male and found in its body a three quarter inch long cylinder of steel, easily recognisable as a part of a piece of tea machinery. This projectile was lodged on top of and at the base of the spine. Quite apart from this there were eleven other assorted pieces of lead and steel lodged in various parts of the body, including a group of five steel ball bearings embedded around the elbow joint of the left foreleg which along with the steel cylinder probably played a large part in causing this tiger to resort to the killing of humans. At the time of the killing the proud owner of the most decrepit weapon I have ever seen informed me that the cylinder of steel was the result of a shot he had taken at the tiger six months previously whilst sitting up in the nearby reserve over a natural Sambhar kill.

I would cite one further instance of this rather futile and highly dangerous wounding of large wild animals. I was requested recently by The Deputy Commissioner to destroy a wild 'makhna' elephant which had been proving extremely troublesome having caused considerable damage to both crops and dwellings over quite a large area. On finally killing it I found it blind in the left eye and actually extracted seven vari-sized lead pellets from in and around that eye. There was a six inch festering wound in the right rump and other assorted shotgun wounds in the forehead and stomach and in my experience there would seem to be nothing that can be guaranteed to upset an elephant more than such body wounds. In this case the very people who had demanded the destruction of the elephant were those responsible for causing the wounds.

I have spent many days and nights out in the local villages, cultivations and jungles at all times of the year, and I would in all fairness point out at this juncture that my remarks apply only to those areas of which I have personal experience, but I have found that the fire, firecrackers, if not a lustily beaten kerosine tin are all that are required to send most marauding wild animals careering back from whence they came, even though this may require re-

peating night after night for a considerable time. These methods are in fact quite widely used whilst the crop protection gun, although sometimes used for its designated purpose, is used extensively for poaching. If the crop protection gun is used by chance against elephant or buffalo, wounding will almost certainly be the result; often with dire consequences to follow.

Condition No. 11 on the reverse of the Crop Protection Licence Form states "Where after the end of any harvest seasons, the State Government considers it expedient that for the protection of wildlife in any area, any firearm or ammunition licensed in this form should be deposited in a police station or with a licensed dealer; it may, by order, require any licensee to deposit such firearms or ammunition for such periods as the arms are not required for the protection of crops or cattle and as may be specified therein, and the licensee shall be bound to comply with such an order." This condition was quite obviously drafted with the very object of helping to prevent the crop protection gun being used for purposes other than that for which it was granted. Despite the administrative problems and the doubtless unpopularity of such a move I feel that the enforcement of the above clause, certainly in areas close to forests, could only prove most advantageous to the preservation of wildlife and would save an untold number of animals considerable unnecessary suffering.

To sum up: Although the idea behind the Crop Protection Gun is basically a good one, and it cannot be denied that crops must be safeguarded, the control exercised over guns issued for this purpose can never be sufficient to ensure that such weapons are not used for poaching. Further, there can be no advantage in either granting or using a weapon for the protection of crops when such a weapon, and these are normally shotguns, is totally ineffective and can only cause suffering to the large animals mainly responsible for crop damage. However if a gun must be issued for crop protection then its barrel should by law be of such a length that it is precluded from being used as anything more than a 'noisemaker.'

Finally if the wildlife of such regions as North Eastern Assam is to be preserved for future generations then action, particularly relating to firearms, such as suggested by Sri S.S. Negi, Executive Vice President, W.L.P.S.I., in the special I.U.C.N. issue of 'CHEETAL', should be taken immediately.

The Great Indian Bustard, *Chortotis nigriceps* (Vigors) a vanishing species in India, and some suggestions for its preservation*

By

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SUMMARY

The past and present status, i.e., distribution and population of the Great Indian Bustard, *Chortotis nigriceps* (Vigors) is given. Characteristics of its habitat have been studied. Causes of its extermination have been stated and suggestions have been given regarding the probable site for a sanctuary for this bird and for re-introducing this species in such areas where there are sanctuaries in the vicinity of its past habitat. Also the need of public co-operation has been pointed out.

The Great Indian Bustard, *Chortotis nigriceps* (Vigors) is one of the most magnificent 'game' birds found in India. The dwindling population and the gradual narrowing of its distribution has been engaging the attention of ornithologists as well as of those concerned with Indian wildlife. K.S. Dharmakumarsinhji (1957, 62, 66) has contributed vivid accounts of its habitat, habits, seasonal movements, food, courtship, etc. He has also (1957) suggested certain measures for the protection of this species. In the present article an effort has been made to give the present position of this bird and a few suggestions for its preservation.

Field characters:

Chortotis nigriceps is a large, turkey-sized bird weighing upto 18 kgs. Its height is about 90 cm. to the top of head. Sexes are alike except that the females are slightly smaller in size. It has a distinctive black crest on the head and black-and-white markings on the breast and underparts. A large whitish patch near the tip of the wings is also prominent.

Breeding:

It is polygamous. Breeding commences after the outbreak of rains in June-July. The breeding season has been variously stated to extend from May to November but the majority of the authors have mentioned it as June to October. The breeding areas have low bushes. Dharmakumarsinhji (1957) says that eggs are laid mostly in the months of August to October when the conditions regarding cover and food are at their best. Eggs are laid singly.

*Published with kind permission of the Director, Zoological Survey of India, Calcutta

Habitat:

The Great Indian Bustard lives in arid, semi-desert secluded grasslands with plenty of low bushes. It prefers well-drained and hilly terrain. By well-drained is meant that there should not be water accumulations in the soil except in large bodies of water such as tanks. Occasionally it may visit cultivated areas. This bird can live on different types of soil, e.g., desert (Rajasthan); black soil (Nalsarovar in Gujarat and Ahmadnagar in Maharashtra); red and yellow soils (Dhrangadhra in Gujarat) and alluvial soil (Balrampur in Gujarat). Its habitat lies in the zone of 5 to 30 inches (12.5 cm. to 75 cm.) of annual rainfall.

Distribution:

Baker (1929) gives its distribution as Punjab, Sind, East of the Jamuna (=Yamuna) and South of Rajputana (Rajasthan), Gujarat and the Bombay Deccan. Stragglers occurred from the United Provinces (Uttar Pradesh), Behar (Bihar), Bengal and Orissa in the East, on the Malabar coast in the South and even in Ceylon. While dealing with the nesting of this bird, Baker has mentioned its occurrence in Gwalior (now a part of northern Madhya Pradesh, and lying midway between Rajasthan and the Uttar Pradesh). Subsequently this bird was reported from Saugor (Deeks, 1935), Afghanistan (Whistler, 1945), Kutch (Vijayrajji, 1943).

Recent sighting of this bird on the basis of reports received from different sources (including the Chief Conservators of Forests of the different States in India) and from Nepal, along with an instance when this author himself had the opportunity of seeing them in the field, are given below.

Maharashtra—Gangapur c.80 km. from Aurangabad (Ahmadnagar District).

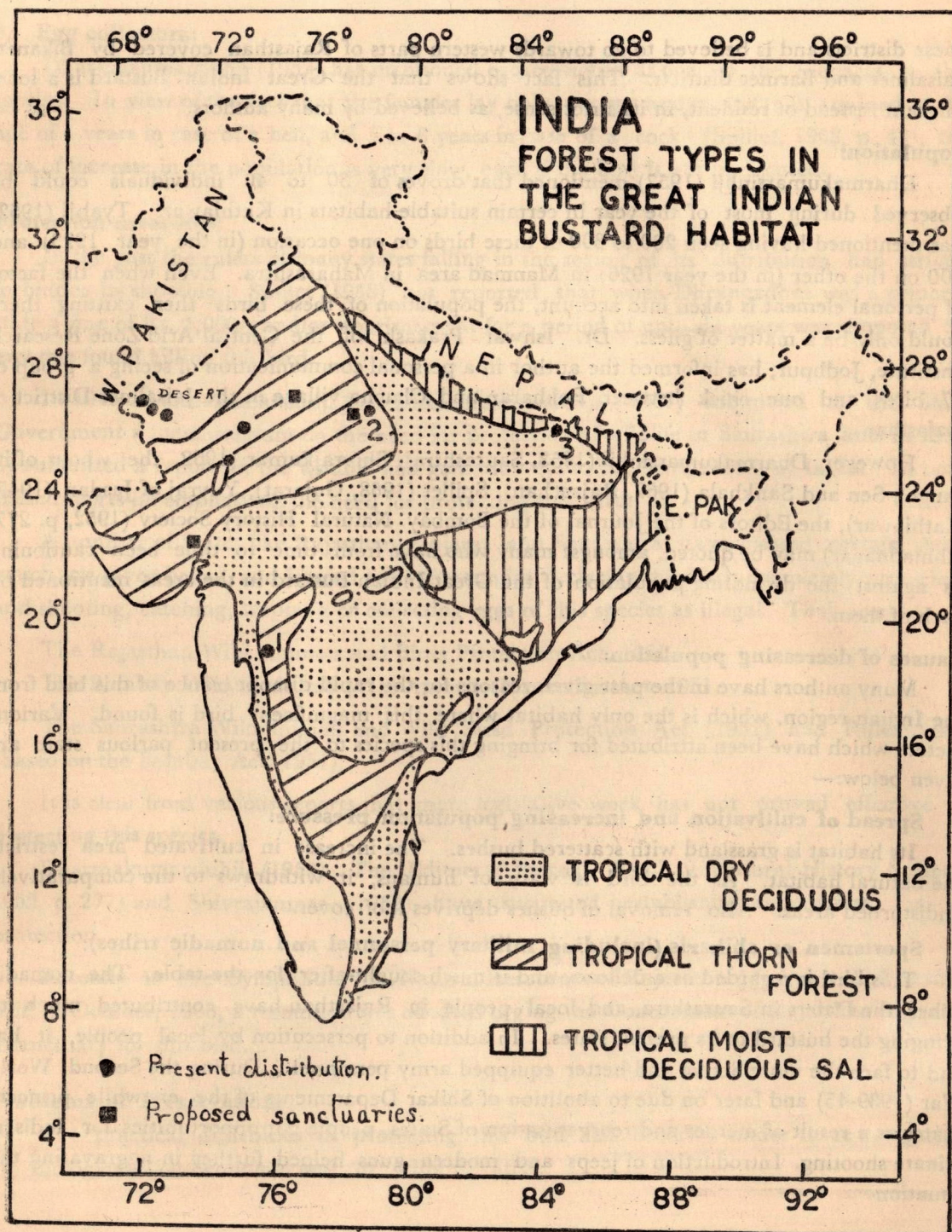
Uttar Pradesh—Dihala, Jhansi District (about a decade ago).

Gujarat—Kathiawar and Saurashtra portion.

Rajasthan—3 Nos. Nagaur District (Jan. 1969), 1 pair Korna village C. 42 km. from Jodhpur (Jan., 1979), 1 pair between Kansaur and Bhinyad village, Barmer district; 17 birds and one chick between Pokharan and Chacha village, Jaisalmer District; Seven birds between Ramdeora and Mawa village, District Jaisalmer, One bird on Chandan to Jaisalmer Road; One bird between Kholla and Pali, District Pali, and 3 birds, Hatamtai Jor Bhinmal Tehsil, District Jalore.

Nepal—Nepal area near Champaran District of Bihar.

Thus, this species is now restricted to Western Rajasthan, parts of Gujarat and Maharashtra (Fig. 1). Although in a personal communication Dr. B. Biswas of the Zoological Survey of India, Calcutta, has expressed his doubts about the identity, its occurrence in Nepal is worth noting. Only once has this bird been reported earlier from Nepal (Gray and Gray, 1846). It has been observed moving to centrally located districts, viz., Jodhpur, Nagaur and Pali, during late December to January or early February. Thereafter it disappears from



these districts and is believed to go towards western parts of Rajasthan covered by Bikaner, Jaisalmer and Barmer districts. This fact shows that the Great Indian Bustard is a local migrant instead of resident, in its strict sense, as believed by many authors.

Population:

Dharmakumarsinhji (1957) mentioned that droves of 30 to 40 individuals could be observed during most of the year in certain suitable habitats in Kathiawar. Tyabji (1952) has mentioned having seen 200 to 300 of these birds on one occasion (in the year 1923) and 400 on the other (in the year 1926) in Manmad area in Maharashtra. Even when the factor of personal element is taken into account, the population of these birds then existing there could only be a matter of guess. Dr. Ishwar Prakash of the Central Arid Zone Research Institute, Jodhpur, has informed the author in a personal communication of seeing a group of 17 birds and one chick between Pokharan and Chacha village in the Jaisalmer District of Rajasthan.

However, Dharmakumarsinhji (1953, Saurashtra), Shivrajkumar (1962, the whole of its range), Sen and Sankhala (1962, Rajasthan), Spillet (1968, Gujarat), Yuvraj of Jasdan (1947, Kathiawar), the Editors of the Journal of the Bombay Natural History Society (1952, p. 277, Ahmadnagar) may be quoted, amongst many who have from time to time been cautioning us against the dwindling population of the Great Indian Bustard in the areas mentioned by each of them.

Causes of decreasing population:

Many authors have in the past given reasons for the rapid disappearance of this bird from the Indian region, which is the only habitat where this magnificent bird is found. Various factors which have been attributed for bringing this species to the present parlous state are given below:—

1. Spread of cultivation and increasing population pressure:

Its habitat is grassland with scattered bushes. The increase in cultivated area restricts the natural habitat. As the bird is wary of humans, it withdraws to the comparatively undisturbed areas. Also, removal of bushes deprives it of cover.

2. Sportsmen or shikaris (including military personnel and nomadic tribes):

This bird is regarded as a delicacy and is much sought-after for the table. The nomadic tribes, the Dafers in Saurashtra, and local people in Rajasthan, have contributed much to bringing the bustard to its present states. In addition to persecution by local people, it has had to face the more active and better equipped army personnel. During the Second World War (1939-45) and later on due to abolition of Shikar Departments of the erstwhile princely States as a result of merger and reorganisation of States, people got opportunities for indiscriminate shooting. Introduction of jeeps and modern guns helped further in aggravating the situation.

3. Egg collectors:

Dharmakumarsinhji (1957) has mentioned egg-collectors as one of the menaces to this species. In view of the fact that the females lay only one egg and maturity is attained at the age of 4 years in case of a hen, and 5 or 6 years in case of a cock, (Spillet, 1968, p. 43), the rate of increase in the population is very slow, even if the bird is not persecuted.

Protection measures:

In the past the rulers of many states falling in the region of its distribution had strictly forbidden its shooting. Spillet (1968) has reported that when Dhrangadhra was a princely state a fine of Rs. 1,000/- and/or imprisonment for a period of upto six years was imposed on any one found killing this bird.

In 1948 Dharmakumarsinhji (see Dharmakumarsinhji, 1957) submitted to the State Government a memorandum on the need for protection of wildlife in Saurashtra and in 1950 he submitted a report on the wildlife and game surveys to the Government of India. In both these reports he emphasized the need for protecting this bird.

A number of States like Rajasthan, Gujarat and Saurashtra have passed certain Acts, which are given below, and framed rules thereunder declaring this bird completely protected, and shooting, catching, trapping or collecting eggs of this species as illegal. They are:—

The Rajasthan Wild Animals and Birds Protection Act, 1951.

The Bombay Wild Birds and Wild Animal Protection Act, 1951.

The Saurashtra Wild animals and Wild Birds Protection Act (1952) and Rules 1965 (based on the Bombay Act, 1951).

It is clear from various reports that more legislative work has not proved effective in protecting this species.

Dharmakumarsinhji (1957), The Editors (Journal, Bombay Natural History Society, 1952, p. 277) and Shivraj Kumar (1962) have suggested establishing sanctuaries for its protection.

Recently in the Symposium on Natural Resources of Rajasthan (Jodhpur University) held in October, 1968, a resolution was adopted urging the Government of Rajasthan to create a sanctuary for this bird.

Problems of Preservation:

The practical difficulties in protecting this bird fall broadly under three categories, (1) Biological, (2) Economic and (3) Administrative.

Biological: It can fly distances of a few miles at a stretch. This factor serves as the greatest deterrent to the creation of sanctuaries because once on the wing and out of the sanctuary area, it can be shot easily by experienced hands as this bird flies slowly at lesser heights. The eggs or the hatchlings (chicks) have got to be protected from predators like crows, eagles and wolves. It appears that the Great Indian Bustard does not have much competition for food in its present habitat.

Economical: Many economic considerations have probably prevented establishment of a sanctuary for this bird. The foremost of them can be possibly the stringent budgetary position of the departments concerned. Although the estimates of Dharmakumarsinhji (1957) for establishing and running a sanctuary require upward revision, it is felt that the State Government concerned should not find it difficult to provide roughly Rs. 20,000/- per year, specially if part of the expenditure is met from the funds received from or through the Government of India or the Indian Board for Wild life.

Another point which deserves consideration is the withdrawal of crop-protection guns in the area where this bird is provided with a home.

Administrative: Merely framing the rules does not serve the purpose. There should be an effective machinery to enforce them. Here the question arises about the competence of persons, who can lodge a report, to bring the person to book for committing an offence. Generally, Forest Officers of the rank of Divisional Forest Officer or Assistant Conservator of Forests are vested with the powers to lodge such reports, but these officers may not be available on the spot. Secondly, there is the question of checking shooting, etc., outside forest areas. These areas are under the jurisdiction of the police who are also not generally available on the spot of the crime.

In order to check poaching, the crop-protection guns should be withdrawn and some arrangement should be made with the military, and the police department; to prevent their armed personnel from entering the sanctuary areas, except to meet urgent situation when the arms are necessary for them.

Suggestions: Most of us may agree on the idea of establishing a sanctuary for this bird. Although many persons have made this suggestion, none has proposed any particular area. While proposing below the four sites, due consideration has been given to the soil, rainfall, type of forest, vegetation and past distribution of this bird. In order to eliminate the task of searching new sites, thereby avoiding the difficulties in creating sanctuaries or national parks, their existence at these places has also been taken into account.

Therefore it is considered most useful to rehabilitate this bird in the existing bird sanctuaries or National Parks, as far as possible in or near the areas of its past and present distribution. Second preference may be given to areas where some reserved forest is existing.

Of the four proposed areas, Shivpuri (Madhya Pradesh) is a National Park, Nalsarovar (Gujarat) is a Bird Sanctuary and Gajner (Rajasthan) is a reserved forest. Ahmadnagar area has been suggested only to explore the possibility of finding, if possible, a suitable refuge. The details of these four places are given in Appendix I.

Alongwith the work of providing a protected place to this bird, watch should be kept on its population. For this a census should be undertaken and, in case it is feasible, a few birds should be kept in the leading zoos of the country to acquaint the public with this bird.

In addition, the tourist departments and the forest departments of Central and State Government should jointly issue pamphlets with appeals to tourists as well as to the general public to help the Government in protecting this bird.

Conclusions: A sanctuary for the Great Indian Bustard is urgently required. The suitable sites for the sanctuary have been suggested. In case any of the proposed sites is selected as a sanctuary for this bird, other areas could also be made use of by reinforcing the departmental machinery to provide greater protection to this bird.

The question of re-introducing this species in areas like Shivpuri, where this bird once existed and where there is a sanctuary in the vicinity of its past habitat, can be considered to advantage. The Union and State Governments should issue pamphlets appealing to people for their help. The leading zoos in the country should keep this bird.

Acknowledgement

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Appendix I

Showing Ecological and other details of the proposed sites for the Great Indian Bustard Sanctuary :

- (1) Shivpuri (Gwalior District, Madhya Pradesh)—Area 156 sq. km. (61 sq. miles), approach: 115 km. S. of Gwalior on Agra to Bombay road and 90 km. from Jhansi. There is a railway branch line from Gwalior. Shivpuri has been declared as National Park in the year 1955. In the past the Great Indian Bustard has been reported around this place, from Saugor, Gwalior, and Dihala ca. 80 km. west of Jhansi, a place which is very close to Shivpuri. Vegetation: *Prosopis spicigera*, *Azadirachta indica*, *Balanites aegyptiaca* (Syn. *B. roxburghii*), *Zizyphus mauratiana*, *Salvadora oleoides*, *Acacia bucephaloea*, *A. arabica*, *Adhatoda vasica*, *Clerodendron phlomoides*, *Ehretia aspera*, *Capparis aphylla*, etc. Soil: black/alluvial. Rainfall 50-75 cm. This place has an added advantage of being located in the centre of India.
- (2) Nalsarovar (Ahmedabad District, Gujarat)—This area has been declared as a Bird Sanctuary in April, 1969. Area of the flood water tank may exceed 260 sq. km. (100 sq. miles) during July or August but by December it is reduced to ca. 208 sq. km. (80 sq. miles). Much of the lake is surrounded by barren shores or flats, and along the higher fringes are found desert scrub and trees like *Salvadora* spp. and *Prosopis* sp. There is an all season road from Ahmedabad. Daily buses are available from Ahmedabad. Nalsarovar lies ca. 80 km. S.E. of Dhrangadhra where this bird was found in plenty till 15-20 years back. Vegetation: *Acacia arabica*, *A. leucophloea*, *Capparis aphylla*, *Zizyphus mauratiana*, *Azadirachta indica*, *Salvadora persica*, *S. oleoides*, etc. Soil: Black Rainfall 50-75 cm.
- (3) Gajner (Bikaner District, Rajasthan).—It is situated ca. 30 km. SW. of Bikaner and has a lake ca. half a kilometre in length and a quarter of a kilometre in breadth. It has both rail and road connections with Bikaner. It has a reserve forest. Vegetation: 'Khejra' *Prosopis spicigera*, 'Jhal' *Salvadora oleoides*, *Acacia arabica*, *Zizyphus jujuba*, 'nim' *Azadirachta indica*, 'karel' *Capparis aphylla*, '2 Thor', *Euphorbia nerifolia* and *E. roigleana*, 'bharut' *Cenchrus catharticus*, 'Sawan' *Eleusine flagellifera*, 'dhamam' *Pennisetum cenchroides*, etc. Soil: Desert. Rainfall 25-50 cm.
- (4) Ahmadnagar (Maharashtra) There is no wildlife sanctuary in the vicinity of Ahmadnagar. The abundance of the Great Indian Bustard in the past around Ahmadnagar and its occurrence there even now is an indication of this area being the natural habitat of the bustard. This opinion was also expressed by the Editors of the Journal, Bombay Natural History Society (1952) in their comments on the article by Tayabji. Although Ahmadnagar has been a great centre of some of the defence activities, the present availability is really a good indication of this area being very suitable for the Great Indian Bustard, which has survived in this part in spite of the fact that there was no princely

state in the neighbourhood to provide protection to the bird as in Rajasthan and Gujarat. Vegetation: *Acacia* spp., *Zizyphus mauritiana*, *Albizia amara*, *Randia dumetorum*, *Cassia auriculata*. Soil: Black. Rainfall 60 cm.

[The Great Indian Bustard is the subject of a W.W. Project No. financed by the Indian National Appeal. The Principal investigator is KS Dharmakumarsinhji. Ed.]

Role of Zoological Parks

By

K.L. MEHTA

There is something attractive about each creature of the Wild—something beautiful or picturesque or curious. The startling colours of pea-cocks and pheasants, the grace of deer and antelopes, the melodious song of many birds, the silken softness of furbearers, the majestic bulk of elephants and the awe-inspiring beauty of tigers, have a profound effect on people's imagination. Even the seeming buffoonery of apes and bears have an appeal all their own. Parental affection, artistry in building nests, dams and bowers, fidelity to the family, and loyalty to the herd are some of the enchanting features of wildlife from which conceited man may learn many lessons.

The large crowds that are daily attracted to the zoos of the world pay homage to the wealth and variety of God's creation. And yet it is a tragic fact that this glory is rapidly vanishing from our environment through felling of forest, invasion of the wilderness and relentless killing of animals and birds for sport, meat, hide, trophy, fur or feather. It is estimated that already 100 species of mammals alone have been exterminated during the last 2,000 years.

Zoos will naturally play the role of asylums to vanishing species of fauna. The interest they awaken in the public may help to stem the tide of destruction of the wonderful fauna of the world. The extinction of a species of wildlife is a great loss to science. It is obliterated from our planet. The need for their preservation is dictated not merely by sentiment but by science as well.

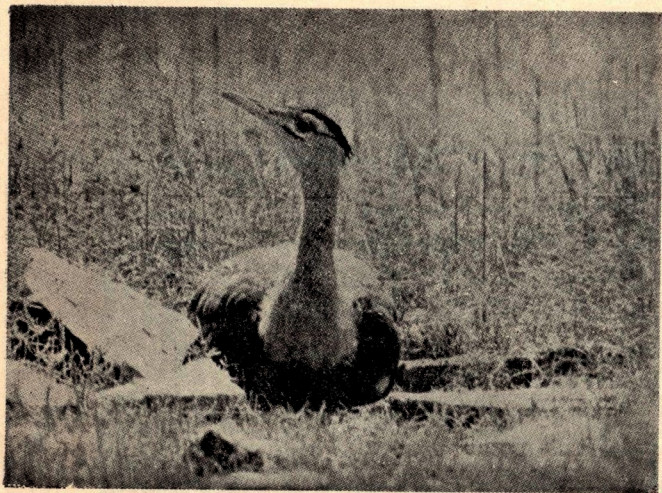
Each year millions of people visit zoological parks and gardens because animals have a universal appeal to people of all ages and in every walk of life. A zoological park is a valuable asset to its community. It serves as an important educational institution. It develops community pride and reflects favourably upon the cultural interests of its supporters. A zoo



Tiger.

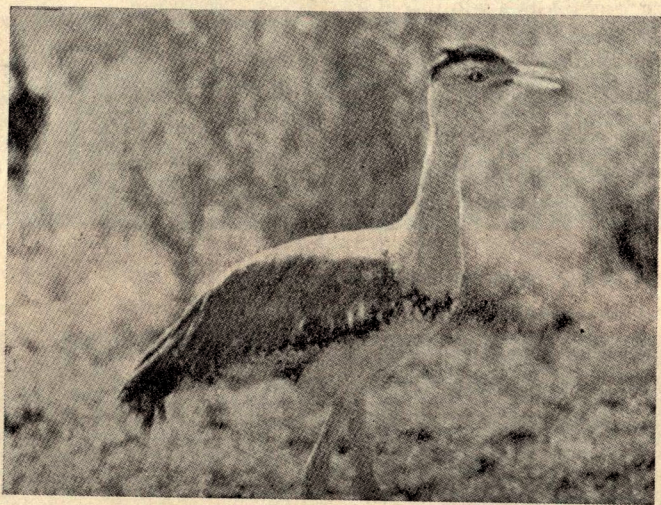


Barking Deer.

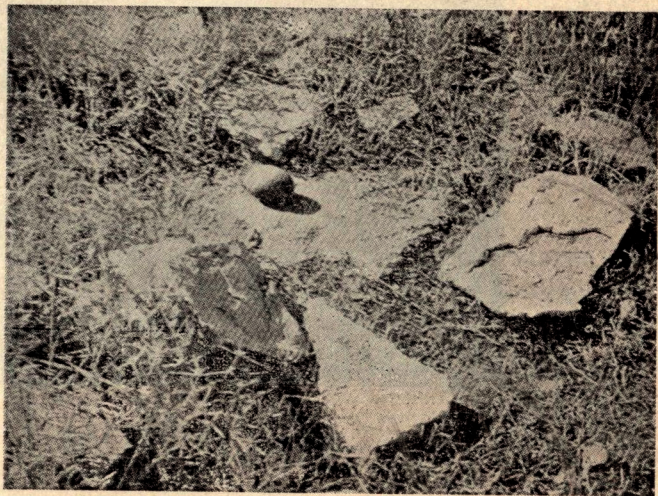


Great Indian Bustard.

Juvenile Great
Indian Bustard.



Solitary Bustard egg in nest.



stimulates business, for visitors come long distances and spend money on meals, housing and retail purchases.

Skilful display of animals fulfils a real psychological need. Mankind hungers for identification with other living things. As life becomes increasingly artificial and complex, people need more opportunities for those associations with nature which are made possible in zoological parks.

Good zoological park designs need the many technical skills represented by zoologists, architects, landscape-architects, mechanical, civil, sanitary and electrical engineers, horticulturists, acoustics, colour and lighting specialists, sculptors, painters and others. The planners who contribute such varied knowledge must work in close co-operation and mutual understanding. Whenever possible, they should visit and examine work in other parks and gain experience.

The way in which the animals are shown in zoological gardens is a factor of the utmost importance to visitors, who should, whenever possible, be given the impression that nothing separates them from the animals, while the animals themselves should be able to move about as freely as possible. For a very long time no attention at all was given to this question, and no progress was made in the methods of exhibiting animals, which were confined in enclosures fenced with iron bars or in cages with glass or wire-netting fronts.

Some forty years ago, Carl Hagenbeck of Hamburg, West Germany, introduced spectacular changes. He no longer showed the animals in conventional cages, but put them in open spaces, separated from the public by wide ditches which were sometimes hidden by rocks. Alongwith this improvement, the behaviour of animals under certain special circumstances showed new possibilities of development of zoological gardens and parks. In our own country, Hagenbeck has set an example of his new ideas, by developing the Zoological Park, Dehli, which is an example of modern display of animals.

In the year 1904 and 1907, Prof. Albert Seitz and Dr. Kurt Priemal of Frankfurt Zoo, Germany, introduced climatic and temperature-controlled aquarium, butterflies-house, reptile-house and insect house, and a marshland for crocodiles, etc. Unfortunately, the Frankfurt Zoo was destroyed in the year 1944 and almost all the animals killed. The people of Frankfurt were anxious to rebuild the Institution which had already a name. Therefore, under the post-war schemes for the Frankfurt Zoo an 'Extorium' was opened in the year 1957-58. It is unique in Europe. In the new extorium, there is one aquarium section, in addition a Polar landscape, a section of water in the bank of a tropical river, reptile-halls, a crocodile-infested-habitat, insect house and large, modern, open ponds for different species of seals. These ponds are linked to machinery for artificially cooling water and air (6 to 8°C air temperature, 5°C water temperature). Another arrangement produces natural snow. Ozone

gas is supplied to maintain the health of the seals. The air in the enclosure is kept free of infectious germs by bacteria filters to avoid disease in the birds. To prevent the glass steaming up from warmth and breath of the public from where visitors see the Extorium inhabitants, the watertight glass plates which are about 4 cms thick are further insulated by glass panes with air in between. Thus, for the first time penguins could be seen in Germany in 1957. Similar extoria is also being given in New York—which may be much bigger in scale. Thus, through modern techniques and study of biological factors and habits of animals, these can be displayed anywhere in the World. Such extoria attract millions of people, scientists and scholars, which helps the economy of a nation.

There are more than 400 zoos in the world and many more are coming up. In India we have 20 well established zoos, the oldest one is in Madras, established in the year 1855, while the latest one is the Delhi Zoological Park, established in 1955. With the great awakening of interest in the preservation of wildlife, many states are coming forward to establish new ones and Himachal Pradesh is one of them.

The purpose of the establishment of a high elevation zoological park near Simla is that in spite of the fact that varieties of interesting animals are distributed in the Himalayas, many of which are little-known to the common man, many of them have become rare and need preservation and multiplication in the park as a conservation measure.

Besides, all zoos in the country are located in the plains and are not suitable for keeping hill-animals. As such a high altitude zoological park in the western Himalayan region, which is richer in the variety of hill species is necessary to complete the chain of Indian zoos for comprehensive display of Indian fauna. Such parks will also be a desirable complement to the Delhi Zoological Park. Between the two Parks, all kinds of animals can be displayed and in summer the hills will provide summer homes for animal species of cooler regions, donated by other countries to the Delhi Zoo. Alongwith the Park, it is planned to establish a Natural History Museum, a botanical garden of Himalayan species a breeding unit for animals and birds, tourists cabins, a lake, wildlife Research unit, small restaurants, a Childrens Zoo, etc.

Thus, this Park, which will be known as the National Himalayan Zoological Park will play an important role in the community life of the Nation as an institution of education and research. It will be an easy to approach for those who seldom get an opportunity to study fauna in the forests. It will provide added entertainment to the masses and lacks of tourists who visit the state every year.

Talgiri Forest situated near Summer Hill, which is connected by railway and road, has been selected for the establishment of this Park. To feed this Park, three Zoological collection

Centres have already been established since 1960 for the collection of Himalayan fauna at Simla and Renuka.

The International Union for Conservation of Nature and Natural Resources has been approached to allot funds from the World Wild Life Fund, and a few philanthropists are being approached for voluntary donation of funds for the establishment of the National Himalayan Zoological Park at Simla.

Jungle Fowl Shooting

By

R. L. HOLDSWORTH

Before venturing to discuss the practice of a sport which has given the writer a very great deal of pleasure, it is desirable to say a few words about the object of the Chase.

There are two species (three, if you count the spur fowl) to be met with in India—the grey and the red. The Grey is confined to peninsular India, roughly south of the Narmada river and inhabits jungle country where the undergrowth is thick enough, being particularly found of bamboo thickets. It is also found in the very dense 'Sholas' of the Nilgiris, at heights of more than seven thousand feet above the sea. It is a handsome bird with a rather pheasant like tailless sickle shaped than that of the 'Red.' The general greyness is largely accounted for by the beautiful black and cream coloured hackles which are in great demand for the tying of trout and Salmon flies.*

The 'Red' is found from the most northernly parts of Madhya Pradesh and Madhya Bharat where it occasionally occupies the same territory as the grey, to the foothills of the Himalayas from Jammu in the North West to Assam in the South East. It seldom climbs far above the five thousand foot contour, where it is replaced by the various Himalayan, pheasants.

There are two races of the red jungle fowl, a heavier, darker bird found in Assam, Bengal and in parts of Madhya Pradesh, not nearly so gregarious as the other, which is a smaller bird much lighter in colour, occupying the greater part of the U.P. and the Punjab. Most of the writer's experience has been with the smaller race.

*The I. B. W. L. is trying to effectivize a ban on the export of thes hackle feathers ..Ed.

In appearance the Red Jungle Fowl is very like a domestic fowl of the bantam type, and it was certainly the ancestor of the old English game-cock so popular in the old cock-fighting days. The hen-bird is a sober brown throughout. The cock has magnificent orange-red neck hackles and darker red hackles above the tail. The breast and belly are very dark brown or black and the sickle-shaped tail is a dark, metallic green. The wings are a mixture of chestnut and black.

I might add that the jungle fowls are exceptionally good in eating, having a 'gamy' flavour quite lacking in the domestic 'Murghi'.

Though I have shot a few grey jungle-fowls and the larger sub-species of the red, most of my adventures have been with the smaller red jungle fowl and in the forests of the U.P. particularly in the Dehra Dun and Saharanpur divisions.

Before planning a shoot it is important to understand the kind of jungle the birds favour. Forests of tall mature trees like 'sal' are not of much use unless the undergrowth is suitable for both cover and food. A lot of time may be wasted beating large areas of such unlikely forest. Ideal country is that terrain known in the U.P. as 'Bhabar,' which is intersected with frequent small and strong nallahs where water is available and also gravel and small stones. The forest consists of tall trees, silk-cotton and various ficus species. The undergrowth will be of small stunted sal, bansa bushes, tall grass, bhang and so on. The ground must not be too wet. The birds dislike wet feet and after heavy rain, will migrate to the hillier, better drained spots.

It is desirable to know something about the jungle fowl's food. They eat a large variety of berries and seed, and of course where cultivation adjoins thin cover, they come out in the early morning and evening to glean the rice or wheat stubble. It is also well to know when particular berries or seed will be ripe. Such knowledge may well disclose huge gatherings of birds in small beating areas. It makes a good deal of difference to the bag if fifty birds get up from a single beat rather than the most usual two or three. Again a particular beat may be bad in October but very good in November according as certain seeds or berries ripen.

Perhaps the most general item of the jungle fowl diet is the Indian wild plum, or 'ber' (*Zizyphus jujuba*), but it attracts the birds only when the fruit is ripe or over-ripe. Then there is a shrubby plant with broad leaves and white flowers which grows as an undergrowth of natural forest species like sal. Its local name is bansa (*Adhatoda vassica*). There is the notorious *Cannabis indica* or 'bhanga' which seems to have for the jungle fowl the same fascination as for various 'Pop' groups in England. Again this is only an attraction when the seed is ripe and the herbaceous part of the plant drying up. The various wild figs form

another popular item. There must be other berries and seed which are eaten though I am ignorant of their names. Bamboo brakes are popular, though whether the young shoots or the seed is the attraction, I don't know.

How are jungle fowl best shot? I will just dispose of some methods I do not recommend from the point of view of sport shooting as well as the size of the bag. First of all there are 'sportsmen' who sit in trees on the borders of cultivation and shoot the birds on the ground at dawn or dusk when they come out to feed in the stubble. This method is neither sporting, nor particularly profitable. There are others who drive along forest roads in jeeps and shoot the birds as they pick for seeds in the dung on the ground. Condemned for the same reason as the first. It is scarcely possible to 'walk up' jungle fowl as one does partridge. First of all the best covers are far too dense for comfortable walking or accurate shooting. Secondly the birds, once alarmed, walk faster than the guns and if they condescend to get up at all they get up out of range. This leaves us with the only satisfactory method, beating up to guns placed in suitable clearings such as nallas or fire lines.

I am against a large number of guns, which means an army of beaters and enormously wide beats. The birds are probably concentrated in an area of less than fifty square yards. If they are put up they probably fly over only one or at most two of the guns leaving the others to wait patiently for their chance to count in the next beat. A large number of beaters seldom beat well. They tend to bunch, seeking the easiest way through the jungles and fail to keep a good line. This means that many birds dart back. Better five beaters who know their job and enjoy it, than fifty who don't.

I think that the ideal number of guns is three. As mentioned before, with large parties of guns some of the sportsmen may get little or no shooting, and the necessarily extensive beats waste a good deal of valuable time. Jungle fowl shooting is essentially a social sport. I used to enjoy it as healthy exercise, not too exacting for the middle aged; the opportunity for some exciting shooting at birds which may offer you some exceedingly difficult shots—not many 'high birds' as in British pheasant shooting—but many snap shots which a sportsman trained on British pheasants might will miss; the friendly rivalry with one or two good friends, the chances of a delightful variation of one's usual diet; and lastly for the infinite variety of the jungle itself in the fine weather of late autumn or early spring. It must be remembered that the variations recorded in the game-book of a well run British pheasant-shoot may be limited to an occasional roe-deer, a hare or two, a woodcock perhaps, and rabbits which may or may not be shot and wood pigeons. In India the variety that may come out of the beat is almost unlimited—from a wild elephant to a mongoose. I have myself seen two tigers

come out of a jungle fowl beat, very many panthers and hoofed game of every kind. Of course armed with a twelve-bore and numbered cartridges one does not offer armed resistance to these other fauna, not only because of the ineffectiveness of the shot but because of the danger to one's beaters, possibly only twenty yards behind, from a wayward or a missing shot. Still, the possibility of such surprises coming out of the beat might put the elderly stock-broker in a British pheasant shoot on his toes.

It is possible to shoot jungle fowl with one gun and a few beaters, though it is difficult for the best of beaters to direct the birds over one gun.

The smaller the beats, in my opinion, the better, because one can get more beats into a single day's shooting. There is also another factor. If you arrange a long beat, many of the birds, realising—they are very intelligent creatures—that something is up, will break back or slip out at the sides. The important thing is, whenever possible, to know where the birds are before you start your beat. This is not always possible and many beats must be undertaken 'on spec', on the grounds that it is a likely looking place and contains the sort of cover and food that the birds will like. In general I should say that, for three or less guns the beats should not be wider than a hundred yards nor longer than two hundred.

How much noise should the beaters make? A great deal of shouting often panics the birds and drives them to break back or sit in trees. Often a successful beat is achieved simply by a judicious tapping of trees combined with the noise the beaters naturally make in making their way through the undergrowth. The birds walk ahead of the beaters until they reach the fire line or nallah or forest glade and take to the air naturally to clear to them, the dangerous area of open ground, offering a reasonable shot.

The dangers of jungle fowl shooting: I do not mean the hazards of wild elephant, tigers, panthers or wild boar, but merely the dangers of hitting one's companions or the beaters. It is essential to know exactly where the next gun on either side of you is. It is also essential that after the beat has started, no gun should move an inch from his prearranged stance. Not so long ago a ghastly accident occurred near Dehra Dun owing to a gun having moved from his position. When the beaters are very close, say within twenty five yards, one should be particularly careful about taking a shot at a low bird in front. Much better to let him cross the line of guns and shoot him behind.

How to hit the damned things? I am the last person to answer this question as I cannot claim to be anything more than an enthusiastic 'murghi' shooter. Most of your shots will be at close range and it is desirable not to use too heavy shot. The jungle fowl is a 'soft' bird, unlike the duck or pigeon and the great thing is to ensure that there are not heavy pellets in

the pattern, but a sufficient number. A young enthusiast once asked me if I could lend him some number 4's as the 6's he was using were knocking off feathers but not penetrating. I told him I had never used bigger pellets than 7's. The fact was that he was not really hitting them at all; he was not getting the bird into anything like the middle of his 'pattern.'

It is better to be in front of your bird than behind. You may knock off some of his tail feathers without inconveniencing him much, but one pellet in the head will kill him.

The usual shot is a bird coming towards you a few yards to one side or the other, or sometimes straight at you and only just over your head. I find the latter incomparably the more difficult shot. You must not shoot too early for fear of hitting the beaters. If you shoot him close overhead you have to swing your gun very rapidly indeed, and if you get him with the full pattern there will be nothing left to eat. With the easier shots to one side or the other my own practice is to start the gun swinging well behind him and catch him up, and when I can no longer see the bird, press the higher. The most frequent mistake is to stop swinging the gun and to shoot at a point where you hope the bird will be, but where it only seldom is. The usual result is that your pellets pass hopelessly behind the longest tail feathers of the most valuable cock, or equally far ahead of his beat.

Occasionally one is tempted to take a long shot—from thirty to fifty yards—usually at a bird crossing a nallah or fireline. Before you shoot make sure that you are not depriving your neighbour of an easy shot or endangering his life. If all is clear, it will be necessary to swing the gun rather more deliberately than with a close shot, and, instead of firing, as soon as you catch him up, to lead him by up to five times his own length. When such a shot comes off one experiences no ordinary thrill!

I find that 'going away' shots on jungle fowl are very difficult, the more directly going away they are, the more so. If in a beat a bird breaks back, unless he is high enough, one should not shoot. The beaters are well within range. The justification of a 'going away' shot is that it is taken when a bird has come over your head and you have decided to shoot him behind the beat where everything is safe. I usually miss or mangle these birds. I am inclined to think I always shoot over them. Remember that you have got to turn round, swing the gun over your head and bring it down on a fast disappearing object. The temptation is to press the trigger before you have covered him. So for going away shots I recommend shooting lower than you think you ought to.

Some sportsmen are inclined to keep their left barrel loaded with LG or SG cartridges in case they are charged by a panther or a pig. This is, I believe, a great mistake. Your left, choked barrel, is invaluable for a second shot correcting your first, or for a long shot.

It would be a pity to waste an LG on a jungle fowl with only five pellets in the cartridge. You ought to make up your mind wheather you are going to shoot jungle fowl only or try for the many larger 'variety'. From the security aspect there is nothing to fear. I have seen two tigers, a large number of panthers and several pigs come out of jungle fowl beats. In no case did they show any aggressive intentions. They were merely anxious to get out of the beat.

In the interest of game preservation, what should be the limit of birds per gun? In the days of unlimited shooting before the war some very big bags were made but they seemed to have little or no effect on the jungle fowl population. Over restriction of bags may well result in over-population and the risk of disease. Moreover, the Forest Department should ensure a fair deal to their licensees, who are entitled to a good day's sport for their licence fee, the payment of their beaters and the petrol they use to get to their shoot. If the limit is as low as six birds per day, it is just possible—it has happened with me—that the six birds are shot in the very first beat. If the sportsman is shooting alone, his day is over after less than half an hour. He has got to pack up his gun, pay his beaters and shikari, and go home. He wanted a day in the jungle. He has had only half an hour. I suggest that the limit should be twelve. Twenty to one gun is an exceptional performance. I have never achieved it. But if three guns together can shoot thirty six birds they have had a fair day's sport and if they reach their limit long before sun down they should be willing to call it a day. The Forest Department must realise that licensees entitled to fifteen days shooting and consisting mostly of professional people, school-masters, doctors, lawyers, service personel are unlikely to be able to shoot more than three days in the fortnight, and their in-roads on the jungle fowl population will have no effect on their natural increase. It may even improve it.

The tiger, they say, is on the way out. I very much doubt it. The survival of the deer depends entirely on the Forest Department's efforts to control poaching. But the jungle-fowl given reasonable protection against illegitimate killing, should continue flourish in our forest and give splendid sport to all who are keen enough to give the matter a little thought.

“A Panther Encounter”

By

PRITI DEBNATH

Jungle features are dark and deep. Mysterious, yes ! but of a quality that inspires rather than forbids, that attracts rather than repels.

Most of us have at some time or other had experience of visits to forests—may be in the nature of “passing through” or for the specific purpose of an excursion—of camping in the forests.

The word “jungle”, commonly known to every Indian as a place where wild animals roam and prey on human beings freely, where other devilish creatures abound and where surely if one were to step “foot”, seconds would punish such intrusion.

All these ideas are untrue, fictitious and imaginary.

It is easy to see where these fallacies have come from.

India, abounds in the greatest variety of animals. It is abundant also in its colourful and intriguing Tribal habitation. Black Magic, real or imaginary, has never failed to entice the Indian into its mysteries—The Indian jungle is also the habitat of Gypsies, the hide-out of dacoits, the mystic refuge of ascetics.

Such are our jungles ! And around these have been woven the tales and legends of a child’s dreams where the Tiger and the Elephant are much loved animals—but feared also !

Where the wolf roams about menacingly ! Where the little hare rises beyond his smallness. Which of us has not known the excitement of these tales ?

And so, the jungle begins its exclusive journey in our lives and remains on untouched ground meant to be enjoyed only in the imagination—in poetry, legend and verse !

In a lesser vein, a striking landscape effect in a passing train—waterfalls cascading down jungle-filled mountains, or streams trickling through, or rivers which are torrential through ravines and gorges.

The jabbering of monkeys in their splendour, elephants, the wild buffaloes, deer and antelope as they come in our vision once in a while only and leave us wonder-struck and enthralled.

Whether in a train—or a passing car or flying over in an aeroplane, the force of nature has captivated us and left indelible impressions. We soon forget the passing scenes of a town,

but we can never forget, however brief the glimpse, however short the stay, that there is a power and a beauty in jungles and animals which, though beyond our ordinary comprehension, are not beyond our reach, to absorb the story of their lives in our world.

But there are people all the world over, whose over-powering love of nature has led them to paths of sacrifice and strength and taken them to disastrous leaps into the unleashed world of forests and animals to give them solutions to the ever-present need of capturing and conquering this world for the larger enjoyment of mankind.

Nature inspired people—writers, poets, painters and photographers have discovered colour, form and animation in the mysteries of these jungles; the philosopher has found his solace and the seeker of thrills his discoveries!

All people, all the world over have never denied the significance which forests and animals have to maintain balance even in the lives of human beings. We are all ardent patrons of the "surface-silent" but "animated-below" world.

In our daily lives what motivates us to do things beyond the mundane? Human beings, our fellow compatriots? No! In our sub-conscious and in the inner depths of our hearts and souls are recessed some impressions which in the hard tasks of life come up again and to refresh the mind, to give the needed impetus, to rejuvenate jaded thoughts and fire the spirit.

There is always the lurking memory of a captivating scene from nature, and the urge to go back to it is stronger than most of us realise. The impact of the colours of a monal pheasant, the form of a pair of sweeping antlers of a sambhar stag, the sculpted chiselling of a rock, the lush growths of the forest trees.

It was the month of October and in Rajasthan it can be quite chilly, particularly at nights. I was in an "open jeep" and the object of this trip was purely "a night-drive!"

Night-drives are a source of great pleasure and offer excitement to all nature-lovers.

Drama, suspense, fear, hope, beauty and thrills, in forest roads, just to see animals which by day are so shy.

We had started at eleven. The night-sky was clear and brilliant and the moon was splendid in its full brightness. Such moon-lit nights are by far the most excellent for visits to the forests and whether it is photography one wishes to do or simply enjoy the natural setting, nothing could be lacking. Silhouettes, shadows, aromas become sharp and the clarity of vision extends beyond ordinary limits.

We had left the main road about a mile back and had entered a broad valley surrounded by low mountain ranges. Cultivated fields extended far and wide and the frequency of villages though limited to a few huts, clustered together, were to be found every half a mile.

We must have passed some five such habitations. The Jeep was maintaining an even speed—on the slow side, as is natural where the object of a drive is to inhale the maximum beauty and not to miss the slightest form, sound, vision.

The air had become more cold, the mountains were gradually becoming higher, closer, the villages were now way behind and the road had almost narrowed down simply, it seemed to give just enough space to the jeep. The jungle growth on both sides of the road was thick and at places pressed so close as to almost brush us sharply with thorns and branches.

It was very still—so still that the whirr of the jeep engine seemed a monstrous sound and in that pure stillness—almost a sacrilege.

The moon was now a little wan and the forest had lost its clarity. It required greater focusing of the attention and concentration of the vision to distinguish objects.

We had been moving for a full hour and had now taken recourse to using our spot-lights focused in the jungle growth, atop the mountains, right, left and front. There was a majestic sight.

A full grown Sambhar stag was sharply silhouetted on the crag of a mountain facing us north-west. He belled, the ringing sound was sharp and distinct and as it resounded and reverberated, others took it up and within moments the air was filled with sound, breaking the stillness.

Soon, as quickly and as without warning, without fuss it died down and silence again reigned.

We moved on and as the night grew now darker and the forests thicker, we drew our breaths in and waited in expectation, anxiety written in the minds of some, challenge in others, and in one or two of us expectation of adventure which would surely come.

Those of us who have been to the forests understand the spirit that moves in each area—we can understand where danger lies and caution should be exercised and where the air is clear.

Here, indeed the spirit was not fearful nor one that repelled. But it was grand and too powerful. We each knew that anything could happen. Surely this was the habitat of the tiger and the panther and who could tell but how and where out of that dark and deep forest a pair of eyes could be watching silently.

While these thoughts crossed our minds, the jeep stopped. All efforts to start it proved futile !

We were thrown in pitch darkness. Even the spot-lights stopped to function.

The main road was now ten miles away.

The reader can well imagine the situation; the bushes on either side were close on us and the darkness and the trees arose straight and vertical, dense and unseeable to terrific vertical heights.

The stillness so without that even the crack of a twig or the rustle of leaves would have made gun-splitting sounds ! None of us felt encouraged to talk !

In moments of suspense and excitement, a tiger appears everywhere. Around the corner, all around ! I was fully aware of minds playing these fantastic tricks.

And then suddenly, it was real, though I wondered and rubbed my eyes to see that it was not an apparition.

It was so quiet, so silent, so swift and so concealed.

Things move so swiftly and so silently that a human being must match his wits, nerves and intelligence to face the animal's stealth.

So, this thing was there. Just ten yards ahead, in that darkness, a form seemed to be gliding and sliding from the right side of the forest to the left. It was so long—it seemed almost gigantic, it was high.

I was fascinated and held to my seat in a hypnotic trance. It was a matter of seconds only. The disappearance is brief and illusory as the appearance.

The fleeting glimpse of this eerie form ended in a known signal and as the tail lashed upwards ever so lightly but the meaning of which could not be overlooked—I understood what this was !

The Panther ! Most cunning of all animals, the swiftest, the most deceitful, it eludes man like none other. Makes an appearance rarely and if it does, it is of so perfect a physical mobility in its tricks of camouflage that it can leave the most experienced of jungle people confounded !

How close it must have been to us. Now my "thrill-seeking" was satisfied.

A visit to the zoo fulfils our desire for the "exclusive" only one hundredth. But a visit to the jungles fulfils, even if we do not see the animals, our normal need for thrills.

Animals in their natural habitat must be seen only there—Jungles must be enjoyed for the sheer power that they hold.

Let Us Count Our Tigers

By

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It is high time that we started, in real earnest, the actual counting of our tigers. There are not many of them left. It is heartening to find the recognition of this position and the serious thinking over the future of this, the most magnificent of the cats of the world. Let me tell you some facts about the tigers that I know. We can perhaps pool our honest experiences to evolve the commonsense and rational approach to the problem of counting the tigers.

I clearly remember—I can even see it now in all its details as it happened 34 years back—that rain bedrenched June afternoon with the soft sun playing into the thicket, when stalking after what I had thought a wild boar digging under a bush, I stumbled onto the *Dhanabereni* tiger deeply engrossed in gorging over a freshly killed cow. I was then 12 years old with a double 12 bore breach-loader—one had to, in spite of the laws, start with such a gun very early in life. I did not have any previous experience of meeting an independent tiger at close quarters. I could have, if I did touch him only, perhaps induced a turn of his head out of the bush and then put a red hot contractile into his brain to earn my first tiger on tender-foot. But, I did not. The reasons were the cautious company of two tribal boys with me and the lack of enough fool-hardy courage. It was good. For it would not have been so tame a process as my discreet retreat.

That way my first visual cognizance of a real wild tiger. I had had, earlier to that, acquaintance with his kind. I took up the gun at the age of eight, a light single barrel English muzzle-loader of my mother—later I changed over to dad's double-barrel breach-loader—and had some good hunting in stalking big game from the age of eleven. *I disagree with the ICBP recommendation for the stoppage of free sale of air rifles. I would wish the younger generation, including the school children, to take up even the real weapons in the proper way of sports—not the armchair poacher types—well guided and early in age. We cannot help conservation with soft-pedalled, often distorted, outlook of the coming generation and our own theorisation on escapist formulae on conservation.*

In those days there was plentiful wildlife in the forests 15 kms. north of Cuttack, the historical town (now a city) in Orissa—sambhur, chital, kakar, wild boar, a host of smaller game, bear, panther and tiger. There were also the seasonal visits of the elephants and occasional influx of wild dogs.

We knew the tigers by their territorial names—*Dhanabereni, Kaliamba, Sapa, Panchbhaia*, etc. There used to be enough food and space for 4 to 6 tigers—a tigress with cubs counted

as one—within a quadrant of 15 to 20 kms. radius from our village, Bhagatpur. During the 15 years of my early shikar days, to my knowledge at least 12 tigers were killed—sports or otherwise—in that small area, without any permanent decrease in the average number of tigers in the range.

Know what it is now? All gone with a sigh, a decade back; even the forests. There is now only the tangled confusion of bushes and blanks; a dreary destitution left in the wake of "human progress".

Towards the south of Cuttack were the Chandaka forests—the famous Chandaka sanctuary in particular. What variety and number of animals! Elephant, tiger, gaur, sambhur, chital, kakar, panther, bear, etc.—ask the old timer in the neighbourhood. It is difficult to believe the stories of that richness hardly two decades back. The gaurs have now gone for good. Sambhur, chital, kakar and even the wild boar are in their last gasp. And, the last tigress in the area, a cattle-lifter, jumped in, 3 years back, for the male tiger in the open air enclosure at the adjacent Biological park, Nandankanan. There she remains, named 'Kanan', the vanguard of the famous tigers of Chandaka forests, a captive for life in the zoo.

I do not think there is any likelihood of natural influx of tigers into any of those two depleted ranges north and south of Cuttack. Natural influx requires some adjacent pressure zone. There is none. For the story is, by and large, the same all over the state. Is it any different elsewhere in this country, if not worse?

In the two decades of my active service as a forester in the state, I have seen far better tiger forests depleted in less than a decade, even. Some of the finest tiger lands in the country, and hence the world, are the northern parts of the Eastern-ghats lying in Orissa in the districts of Phulbani, Ganjam, Kalahandi and Koraput. The latter two had for long been famous for the numerous tigers and the equally large number of man-made man-eaters (of the 7 man-eaters that I have shot, 6 had been man-made by irresponsible L.G. shots). At present the tigers here have been so thinned out and so much scattered in population that in many cases a tiger may roar hoarse with its mating calls, there will be no response from any prospective mate because there is none within hearing distance. There will be no procreation and thus no stable population. When such individuals die or are killed there will be no more tiger left in those areas, like what had happened to the Chandaka sanctuary. Surely it deserves serious thinking and positive action, with counting as the first step.

It is the man-eater or the confirmed cattle-lifter that provides us with reliable symptoms to assess the most important parameters in the behavioural pattern of the tiger; its territory, its methods of predation and how far restricted is its mobility within the command area of predation.

It is wrong to think that when a tiger becomes a man-eater, it gets some of the intelligence of man and ".....avoids leaving behind his pugmarks by making leaps over open

paths and cleverly keeps to hard ground....." (page 75, CHEETAL, Vol. 12, No. 1). Quite on the contrary, it would be busy sneaking near the paths and roads, and often leaving much of its spoor on such paths and roads. The chances of getting human prey in such areas are evidently much better. The tiger during its gradual aberration to regular man-eating, has to absorb this inevitable impression to be a successful predator on man. And, be it a man-eater or a cattle-lifter, the basic trend of its behaviour, a strong territorial habit, remains largely unchanged. Its pattern of movement in such a territory will depend on the layout of the land, the terrain, the nature of cover and the concentrations of these abnormal preys.

Regular cyclic rounds in the territory have been often noticed by me from kill evidences obtained from local enquiries and the police stations, records. The problem of tracking the aberrant tiger is much simplified thereafter. And when one knows the forests, anticipation-stalking yields much quicker results. I have shot quite a few man-eaters and confirmed cattle-lifters in this way, by tracking them in their own patterns of movement.

Agreed, that no two tigers are same, and also that there may often be wide variations in the psychological makeup of the cubs of the same litter. But, when a tiger starts leading its own independent life, what will it do to maintain the chances of getting food at regular intervals? The tiger has to deal with mobile quarries which are as alert and agile to avoid it as its own keenness and necessity to get them in time. The tiger cannot afford to be unmethodical. The instinct is ingrained. It has to know its territory well and learn the technique and timing of getting at the prey without causing undue scare or drain at any particular place.

Let me draw a parallel behavioural pattern in human beings—a semi-nomadic hill tribe in Orissa, the *Kharias* for example. In the northern parts of Orissa there is a compact block of nearly 2000 sq. kms. of beautiful rolling table-land, the famous Simlipal hills, still with a rich cover of forests and wide variety of wild life. Here live the *Kharias* whose main subsistence comes from the forests—the edible tubers dug deep from underground. Different family groups of *Kharias*, have, by tradition, specific hereditary territorial limits of operation. Each group covers its jurisdiction in a methodical pattern and takes a part of the produce at each place, leaving enough in the soil to continue to grow till the next trip so as to ensure sustained production of the tubers. They also collect various kinds of minor forest produce—great experts in collecting rock-bee honey. Last year, I wanted some of the experts of a group to go with me to a new area to collect honey. "No", they said with emphasis, "we do not know the area. We will get lost". I remembered my own predicament when alone with my gun I had twice lost my way and had to stay over-night in unfamiliar forests. I also thought of that lone tiger with all its accumulated experience and impressions gained in its command area, supposedly trying to change its habitat. Why should it do so, I thought, unless very peculiar circumstances forced it out of its home territory?

Take the case of the Bori man-eaters in Kalahandi, a family of 4 (mother and 3 grown up cubs)- in 1963. They took to man-eating and within a month killed and ate up 15 persons. The forest was totally shunned by the villagers and their cattle. All forest work stopped. But the tigers continued to stick on for quite some time when on March 15, 1953, hungry and desperate, they offered me a lucky chance to get the mother (8'—8" round the curve) and a female cub, almost adult (8'—2"). Both had been carrying maggotted L.G. wounds. With their exit, the man-eating stopped. Their persistence in the home forest in spite of growing difficulty in getting food, proves the rule — the parameter of established territory.

But there are exceptions to the rule also, I have seen such a tiger in 1956—a ten-foot male—who had been partially disabled, in his fore-legs, by a porcupine in the Similipal Hills. Driven by sheer hunger he had left his home forests for whatever, however and wherever.

When I suspected him, I kept track of his movements and did some stalking too. He ended up with his last attempt on a man 50 kms. away from his original territory. I had to chase him down his trail to get him by lying prone on the ground, a hot contractile quickly placed in his brain from 6 metres (what I could not do at the age of 12, I did at 32; but 20 years is a long time and a lot of experience, too). Autopsy showed not a single speck of solid right from the stomach to the rectum; nothing but some water. With such a howling hunger, why talk of animals, even human beings would lose their normal bearings.

I have also seen quite a few tigers driven away from their home forests in the southernmost region of Orissa—the Motu-Malkangiri area in Koraput district. Large scale deforestation, over 400 sq km, for the Dandakaranya and other settlements and the hydel projects, uprooted the tigers, the other rich wildlife and the rare wild buffalo. Many got killed. Others fled and tried to find new refuges to somehow stick on till they got settled in the new habitats. But for how long?

In their individual northward ramblings, a few of the tigers entered the forests of Ramgiri Range. Here I saw some of them and the tracks of others, when I was after the Gupteswar man-eater in December-January, 1967-68. I say it was an influx of tigers because I had fairly thoroughly seen those Ramgiri forests, about 300 sq. kms, in 1965-66 when there were only three tigers, and no cubs. How then these 9 in 1967-68? The man-eater had a wide beat overlapping those of 6 other adult tigers; and in the contiguous forests, there were the remaining two. This is how they had arranged themselves.

- i. A pair in the northern outer fringe towards Malchua.
- ii. A young male between villages Kirimiti and Jabapadar.
- iii. A female with a cub on the northern side of Ramgiri-Gupteswar road.
- iv. A huge impatient and irritable female to the south of the said road.
- v. A big male cattle-lifter near Panasput.

- vi. A young female often found in the road taking off from Matpad into the deep recesses of Dharamgarh forests.

I could clearly mark out the limits of all the above six tigers during the one week of my tracking the man-eater in convergent anticipation-stalking from Kirimiti, and the 13 days of trailing that animal (after my .375 magnum 300 grained soft-nose ploughed through the fleshy chest, left lung, ribs and out) till I got to the last remains inside a ravine 30 kms. away from where I had shot it. The other two tigers were outside the man-eater overlap.

There were already thirty human kills by the man-eater when I took up the tracking with what was supposed to be two days old pugmarks. In spite of the other tigers in the area it was possible to recognise the pugmarks of the man-eater—did not see many though. On 3rd January morning I saw its fresh pugmarks in the forests near Ramgiri. I saw the pugmarks of the tigress with the cubs and the big lonely tigress also. That day was the weekly market day at Ramgiri. Naturally the man-eater and I had both converged to that region—he to get one of the market going men and I to get him. Late that evening I surprised the man-eater, in apparent distress without food, crouching behind a log beside the path. A brave lady—an equally efficient tracker too, my fair cousin Nihar—was holding the 5 cell flash light. The first squeeze on the trigger produced only a loud click—a new Norma-Re cartridge! Immediate bolt action made the tiger move and simultaneously it got the next shot end-on. The flash light was steady till the end, and, that is the greatest back-up fortitude and confidence I have seen in my 38 years of holding a gun in the tiger land. There was no more man-eating thereafter—evident proof that I had shot the man-eater. This clearly points out some obvious and convincing symptoms which support what I have said earlier. That the tigers, even if they move out to a new area, soon try to establish their own territories. The confirmed man-eater's overlapping jurisdiction was a necessity in view of the large tracts of forests and scattered habitations and the human being keeping increasingly away from the forests. All these tigers were living side by side in a small range possibly with contiguous marginal overlaps and the general overlap of the man-eater. Yet there was no difficulty in distinguishing each individual to the extent of pin-pointing the man-eater. But of course it needs some field practice for efficiency in tracking and distinguishing the differences, which can be done by any body with a little interest in such field work. The measurements and rough drawings of the pugmarks with a few plastercasts make the work much easier and more confident.

While thinking about tracking I often remember of my boyhood *gurus*, Dina and Baraja. The former was a crack shot also, but the latter was the real uncanny tracker. Short lived as our average tribal is, both are gone with those vanished assets of nature which they loved so much. I have seen in the other tiger lands of Orissa, local talents also who could be placed on par with my *gurus*; the Langda of Malchama was even better than both, in tracking with

me the man-eater of Asurgarh. The most enthusiastic, however, of all, is old Makunda of Chhotkei in Angul Forest Division. His enthusiasm and confidence are infectious. And without being asked, he keeps, for his own pleasure, a keen interest on the local tigers, elephant and gaur.

Why do I name them? Because, with the vanishing tigers and the wild life, the number of such local talent is steadily decreasing. Who then is going to keep an eye on our tigers? When we actively wake up to the realities, who is going to lend the most effective hand of cooperation? We should keep the interests of such men, alive. We should cultivate their friendship and cooperation. We should leave our tables and be more with them in the forests. It will do much good to the tigers and other wild life too. It will do good to us also to refine our bookish outlook with pragmatic blending. *I am sure it will save us from wasting our time and the poor man's money in theorising on expensive projects of uncertain results.*

We need the help of many more of such local men like Makunda. And we need also to stimulate the custodians of our forests and the wild life, even at the lowest rung, to take an active interest in the wild life, particularly the tiger.

The visible results of such stimulation I saw when I took up the first counting of the tigers in Orissa in December 1966. Many of the forest employees and the local men like Makunda, participated in the census. Later, whenever any of them met me he would start off talking first about the tiger in his area—very significant in the interest of the tiger and the wildlife also.

The method of counting was what is known as the 'cooperation census'. First week of December was the period of census. I have been asked, "Why in the first week of December?" Well, this time of the year it is getting fairly cold. There is heavy fall of dew which makes the coat wet. The thick grass and many of the other ground cover are getting coarser and are usually with troublesome spiny, hooky or sticky flowers, fruits or seeds. The tiger avoids these, especially during the early hours of the morning, and keeps more to the foot-paths, roads and open areas. The chances of seeing the fresh pugmarks, if not the tiger, are much enhanced. Moreover the harvesting season being half way through, there is more willing local cooperation. The early morning forest is not yet forbiddingly cold for the local participants in the cooperation census and hence there is more intensive tracking and replecation, to refine the counting of Forest Guards and other participants.

The parameters of the census are the strong territorial habit and the methodical movements of the average individual—aberrants are very rare which do not affect the effective use of the results.

Preparations for the cooperation census had been made in consultation with my colleagues. The standard counting sheet will be like the sample in facing page. Efficiency much depends on organisation. The pattern of field arrangement of the counting sheets by

COUNTING SHEET No

Species — TIGER (*Panthera tigris*)

Period of Count — December/June 197 .

..... Division	Name of participant.....
..... Range	Address
..... Section	
..... Beat	Coordinator.....

Overall location of the area covered during the week.

- Terrain : % of — hill () / hill-plain () / plain ()
 % of — ravinous () / broken () / unbroken ()
 Cover : % of — dense trees () / open trees () / open bush () /
 open grass () / barren land ()
 Concern : a) — Natural preys — abundant/normal/bare subsistence/none left
 b) — Human competition — heavy/rational/negligible
 c) — Cattle competition — heavy/normal/negligible
 d) — Nature of protection — good/fair/bad/worse
 e) — Local cooperation — good/fair/nil

Special information from participant.

Do you reliably know of any tiger in the following layout around your counting unit?

1. If you have not seen a tiger or its pugmark during the week, do you reliably know of any tiger in your area?

2. Which side was it during counting?

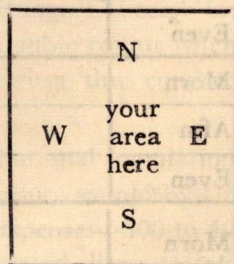
3. When was the last man-eating/cattle-lifting?

4. When was the last tiger if none exist now?

Remarks of the coordinator and other supervising personnel.

Counting sheet No. ?

Counting sheet No. ?



Counting sheet No. ?

Counting sheet No. ?

Here the details for the above layout please

1. How far is the tiger from your area?
 N) E) S) W)
 2. What sex ?
 N) E) S) W)
 3. Has the tiger ever come to your area of count?
 If so when and how often ?
 N) E)
 S) W)
 4. Longest distance covered by you during the week of count, in your area, from the centre.
 N) E) S) W)
 5. Any other useful information.

THE WEEK'S LOG-BOOK

Date	Particular area visited	Time	Tigers seen				Pugmarks seen				Remarks including sl. No. of plaster cast, size of pugmark
			Male	Fema	Cubs	Unkn	Male	Foma	Cubs	Unkn	
1		Morn									
		Aftn									
		Even									
2		Morn									
		Aftn									
		Even									
3		Morn									
		Aftn									
		Even									
4		Morn									
		Aftn									
		Even									
5		Morn									
		Aftn									
		Even									
6		Morn									
		Aftn									
		Even									
7		Morn									
		Aftn									
		Even									

Signature of D.F.O.

Signature of participant

Signature of coordinator

the coordinators is very important. The coordinator for a small range is the Range Officer himself. In a big Range the Foresters are the coordinators under the overall supervision of the Range Officer.

The presence or absence of tiger in a forest is usually known both to the forest employees and the local people. When there were plenty of tigers, nobody really cared to know about how many and where. But still, the random examples cited by me would show that a rough idea about the number and locations was the inevitable sequence to a living with the tiger in the same environment.

The tiger population has drastically decreased during the past decade. In Orissa at least, you now find a lone one here, a pair there and no more any, elsewhere. The existing ones are thus better defined in individual location and territory. It is, therefore, easier to assess the anticipated counts for each coordinator to determine the intensity of work programme — stratification. The jurisdictions or maps for the counting sheets are so arranged as to minimise overlaps of territories. Each counting sheet may cover one or more F.G. Beats. When it covers more than one F.G. Beats, the concerned F.Gs form a group and have correlated counting to avoid duplication. This is done under the guidance of the coordinator. A tiger with a long and wide territory may still, by mistake, be counted as two different tigers, by two F.Gs, placed wide apart. A few such cases did happen in my 1966 tiger census in Orissa. It happened mainly in the Phulbani Forest Division. I and the Divisional Forest Officer, Sauri Bose, spread the topo-maps before us and positioned the related counting sheets on those. With some practical commonsense tuned to our and the Range Officers' local knowledge of tigers, the probable duplications were marked out. The double counts whenever found in the recheck, were eliminated. The total number of tigers in Orissa, thus counted in the first week of December 1966, was 326.

Was it an absolute count? Evidently not. No wild animal population count can be an absolute count. Take the case of the recent lion census, as told by Dharmakumarsingji (pp. 48 to 56, CHEETAL Vol. 12 No. 1). With all the expenses—300 to 400 live baits alone (not without a lingering inducement also, left to the uninitiated lions to take to cattle-lifting) and all the men and maintenance—what was the result? I quote from page 52, “..... the Forest Department had already made an assessment of the lion population before the main census and had arrived at a low figure of 160 lions, which nearly coincided with the results of the main census.....”, and from page 56, “The result of direct visual count of lions. total of 162. This reveals that there are not less than 162 lions in the Gir Sanctuary and its environs”. To this figures of 162 has been added the pugmarks evidence counts in outlying areas to place the total finally at 177—evidently not an absolute figure either.

With all the decrying of the attitude of the forest department and the cheap but practical methods of census conducted by the foresters, how was the so called ‘direct visual count’

method superior to the stalking and pugmarks counts? And what positive advantage or reliance did it bring? To my mind, not to any extent that the expenses would justify. What, after all, is our aim in getting to know about the number of lions, tigers rhinos etc.? We want to get a reliable idea of the position with these vanishing assets (I am not considering the census for crop management). We want to base our assessments on reasonable practical lines—not hearsays and wild guesses—commensurate with the expenses. We want to evolve a pattern which can be repeated, without much pomp and drum-beating, by the local staff to give us a dependable grip on the trend of the population.

Let us again read between the lines—the census aspect only—and try to visualise the ‘cooperation census’ method applied by the practical foresters and the ‘direct visual count’ method as stated in the story. The cost of cooperation census is almost nil. The pattern can be fitted into the normal duties of the local staff—a little training, a small lead and a pat on the back for good work—and, it can be repeated every half year even. What, on the other hand, is the cost of the ‘direct visual count’? From the story itself I guess it to be around Rs. 20 to 25,000. What is its confidence? Anybody’s rational guess. And whatever it be, the confidence in the ‘co-operation census’ is equally as high (160 : 162 to 177). The cooperation census has its inherent level of error—all census methods have it in different proportions—which will repeat in the successive censuses to give us a near absolute confidence level in the population trends. What we are really concerned with is not the actual number but a reliable standard of measure, as near the actual as is economically possible, which will repeat true to give us the confident indication of the trend of the population—whether it is increasing or decreasing and that at what rate? This will give us the required grip on the management.

Take for instance the 326 tigers in Orissa in December 1966. The census results created a sensation and made everybody aware of the not too happy position with the scattered and much too thinned out population of tigers. Those who had been pressing for tiger shooting permits, became silent. Much concern was expressed by the press and the A.I.R. All shooting of tigers was stopped, except man-eaters. What was necessary, after earning this general concern for the tiger, was to press home the advantage by repeating the census—even twice, December and June—every year. It was done again only in December 1968. The result has not been published yet! I know it will disclose more distressing picture. I will be happy if there are even 250 tigers left in my state now. Because I know, the poacher—more of the cruel poisoning type using crop insecticides—has remained as active as ever for the skin, in spite of the ban for the export of tiger skins. The ban takes an awful lot of time to reach the distant folds of the tribal hills. But the bait of the smuggler—Rs. 1,000/- for panther and Rs. 1500/- for tiger skins, raw—offered to the local man is too much of a temptation to resist. I have seen written offers from Calcutta smugglers, carefully kept by the poachers in the area.

That is why I have been emphasising repeatedly that we have to act and act very fast with determination to save whatever we are still left with. The surest way to keep track of the results of our actions is to keep an eye on the population trend. If the number 326 in Orissa has now fallen below 250, there should be no hesitation to place the fact boldly before the people because without their help and sustained co-operation we will never be able to save our tigers or any of the other rare animals.

The co-operation census as explained here, should be repeated in all tiger areas, in this country, every six months—in the first weeks of December and June. In early June again, it is easier to find the tiger near the water holes and prominent concentrates of game niches. The December count will give the basic population trends and the June ones will form the backup image. Repeated as the counts will be every six months, the results should be flashed out effectively. More and more people will get interested in it. Soon there will be offers of voluntary participation by many existing and prospective conservationists. Small groups of youth camps, timed and distributed with the census works, can directly involve the younger generation who have to be actively associated with the future of the wildlife in this country.

Let us do it, I urge, in right earnest—count our tigers with the co-operation of all. Once we know the clearer truth about the tigers, we start seriously thinking on the problem of conservation. When we conserve this great asset in our wildlife we cannot but pay equal heed to its natural preys in other game animals. When we are in a position to allow the removal of a normal tiger for sports from any balanced range, we can judiciously permit the removal of some of the game animals also which would have fed the tiger had it continued to live and will thus form the surplus removable stock, after the exit of that tiger.

Stands to reason, is it not? And to commonsense, which of course is the most reliable sense often very much in need for application, but indeed, so very little applied in practice.

National Parks and Sanctuarie in Maharashtra

By

S.S. BUIT, I.F.S.

Introduction

Human needs, sheer vandalism, apathy and ignorance have led the valuable nature-endowed heritage of wildlife in India to be gradually depleted. As a result of the indiscriminate slaughter of wildlife and thoughtless destruction of forests, to satisfy the agricultural needs of an ever increasing population, many species of wild animals and birds have either become extinct or have been driven to the verge of extinction. In many parts, the wild animals have been totally exterminated, while in others, where they were abundant, they have become comparatively rare. Man has been persecuting wildlife for his own ends, without appreciating its value and importance in the maintenance of the balance of nature. But for human interference wildlife, an important constituent of the natural biotic complex, could exist in a natural state of equilibrium with its environment, governed by the law of survival of the strongest and the fittest.

Maharashtra's Rich and Varied Wildlife

Despite much destruction, Maharashtra has still a rich variety of wildlife, in fair abundance in some localities, viz., The Pench valley forests in Nagpur, Nagalwadi forests of Bhandara, Nawargaon and Garpit forests of Wardha, Taroba, Kolsa, Moharli, Kanhargao, Chaprala, Allapalli, Sironcha and other forests of Chandrapur; Melghat forests in Amravati, Kinwat in Yeotmal, Yawal ann Chopda forests in Jalgaon, Radhanagari in Kolhapur and Amboli Rampu forests of Sawantwadi.

Among wild animals observed in the Maharashtra State tiger, panther, bison, sambar, chital, blue-bull, barking deer, sloth bear, wild dog, wild pig, and hyaena are fairly common. Blackbuck are confined to a few localities. Wild buffaloes are reported to stray occasionally in Bhamragarh forests in Chandrapur from Bastar, their natural habitat. Pangolins are local.

Pea-fowl, jungle-fowl, spur-fowl, partridges, quall, cotton teal, pigeons and parakeets are the common birds. Bustards are seen in the Nagar scrub forests, their former breeding ground. Migratory birds like duck are common in season.

Precious Heritage

Even though wildlife is fairly rich in variety, it is confined to remote forests. The forces of destruction of wildlife everywhere are ever on the increase, even though Maharashtra has the finest legislation for protection of wildlife in the whole of India. The reasons

are obvious. Enactment of legislation by itself will be of little avail unless the public conscience is aroused and basic concepts of conservation, the economic, social cultural and aesthetic values, are instilled amongst the enlightened populace and forest folk.

A developing nation can ill-afford to ignore the aesthetic, cultural and scientific values of wildlife conservation. Immediate steps need to be taken to protect the natural haunts of the existing wildlife so that they can find conditions favourable for breeding and to help rehabilitation of the once rich fauna in the glory of the primeval forest.

National Parks and Sanctuaries

The answer to this vexed problem lies in the creation of National Parks and Sanctuaries, in the country, which have a great potential as national and international tourist centres. A National Park is an area dedicated by statute to conserve scenery, natural and historical objects of national significance, and wildlife. A sanctuary is an area where the killing and capturing of any animal and bird is prohibited, except under orders of competent authority.

Taroba National Park

This park is situated in Moharli Range of West Chanda Forest Division in Chandrapur District. The park is approachable from Chandrapur—also a Railway station on Central Railway—by a fairly good road, distance being 45 km. For the visitors, Taroba provides a modern Guest House and a Forest Rest House. The Park can be visited during the fair season, i.e., from November to June, the best time being the summer months for watching wild life.

Wildlife can be seen in abundance after dusk, if one motors down the loop road near the lake. For the convenience of the tourists, the Forest Department has also made arrangements to take them round the Park in a coach—a 25 seater—fitted with search lights and microphone. Occasionally in the evening, as one drives in the Park, the king of the jungle crosses the road to greet you. There are herds of chital, sambur, bison, chinkara, blue-bull and wild pigs around the lake. Sloth-bear, barking deer, four-horned antelopes, hare and porcupine are also seen in the Park.

Around the lake, beautiful birds will be observed. For visitors, boating facilities are provided in the lake. A drive along 'Chital Road' which crosses many game tracks and grassy lawns, will show the haunts of large herds of spotted deer and the glorious bison grazing in pasture. Pea-fowl and jungle-fowl dance here. For watching wildlife six watch towers have been provided near the lake and salt licks have been made.

Borivili National Park

This proposed National Park extends over about 65 sq. km. comprising the entire contiguous forest areas situated north of Powai lake near the metropolitan city of Bombay which rightly prides itself as 'Urbs Prima' of India. The park comprises the catchment of Vihar

and Tulsi lakes and the Dahisar river with affluents. The hills, with several plateau and vantage points, give a panoramic view of the Arabian sea in the west, the Thana creek in the East, the Ulhas river in the North, lake expanses of Vihar and Tulsi within the park. Atop the forest clad hills, overlooking distant watery expanses, with the mellow breezes that waft gently in the evening, the back-drop of hazy horizon, filtering last rays of the setting sun, and the myriad lights that flicker as the darkness settles all around, is an unforgettable spectacle.

Kanheri caves within the Park provide a rich cultural fare and testify to the ancient architectural achievements. "Ashok Van" near Kanheri, the mango grove of "Satibaug", the pavilion on the hill near Borivili entrance and Mahatma Gandhi Smriti Mandir add to the attraction.

The wildlife is near-extinct, except for occasional panther and barking deer. Langur are common. Due to mixed vegetation and the lakes, there is a fine assortment of birds in the lake area. Forests do provide an excellent habitat for propagation of indigenous fauna. The Natural balance will soon be restored with propagation of desired species and rigid protection.

Pench National Park

The proposed park extends over an area of about 250 sq. km. and is situated in Deolapar and West Pench Ranges of Nagpur Forest Division. The forest area is more or less a compact block of 15 to 20 miles long and 5 to 10 miles broad. The park is about 72 km. from Nagpur.

The Pench forests have a great variety of birds and animals. The animals most commonly seen are sambur, chital, barking deer, panther and bison. Some of the spots are known to be the favourite haunts of herds of bison which can be seen by the visitors during summer. Among the most colourful birds, the peacock, is common.

Two rest houses at Tataldoh and Ranidoh and a rest house at Sillari are available in the park area; 8 watch towers have been constructed at suitable places.

Radhanagari Sanctuary

This sanctuary is situated in Radhanagari range of Kolhapur district, which is about 72 km. to the west of Kolhapur city. The sanctuary has been created in 1958 specially to protect the bison which were fast vanishing from this tract. The sanctuary covers a small area of 20.72 sq. km. There is a rest house in charge of Irrigation and Power Department, at Radhanagari village. Though essentially a bison sanctuary the other animals are panther, sambur, barking deer, hyaena and wild dog. The ideal time to visit this sanctuary is between January to May.

Karnala Bird Sanctuary

This bird sanctuary is located in the area of Karnala fort area of Kolaba district. This sanctuary is established in 1968. This area is 4.48 sq. km. It is located about 80 km. from Bombay and about 12 km. from Panvel on Bombay-Kontan-Goa road.

The forest area abounds in bird life and during the migratory season from October to April 140 species of birds have been recorded in this small area. Karnala has two distinct seasons from the point of view of bird watching. At the beginning of the monsoon, one can see paradise fly-catcher, shama, malbar whistling thrush, racket-tailed drongo and a variety of other species nesting in the forest. A rather rare heart-spotted woodpecker and also the red backed woodpecker have been seen in this forest.

In the cold weather the migrants take over and the pattern of bird life changes. The migrants include the wheater, blue throat, black bird tendur similium mah, blue headed rock thrush, red breasted fly catcher, ashy minivet, black-headed cuckoo shrike, large cuckoo shrike, grey drongo, rosy pastor, grey headed myna, rose finch, white wagtail, grey wagtail, tree pitpit, etc.

Overlooking the Karnala fort two timber rest houses each with two suites and fully furnished are constructed. Additional accommodation in tents is also available for the visitors.

Dhakna Kolkaz Sanctuary

This sanctuary lies in the well known Melghat forests in a hilly terrain covering the Gawilgarh ridges of the Satpura ranges in Amravati district. Area of the sanctuary is 381.58 sq. km. Some of the finest specimen of tiger are seen in this area. Besides tiger, panther, sambhar, blue-bull, barking deer, spotted deer, bear and wild boar occur in fair numbers. The Forest Rest House at Kolkaz commands a beautiful view of the forest around.

This sanctuary is about 80 km. to the north of Amravati, the nearest railhead being either Badnera on Central Railway.

Yawal Sanctuary

This sanctuary is located in Satpuda hills of Yawal Forest Division forming a strip lying between the river Anir in Usmani range and river Suki in Raver of Pal Range. Area of the sanctuary is 177.52 sq. km. the nearest railhead by which it is accessible is Raver on Bhusaval Delhi section of the Central Railway. The wild animals that are seen are tiger, panther, sambhar, blue-bull, spotted deer, wild boar, jackal, hyaenas, wild dogs. Among the birds, pea-cock, jungle-fowl, partridge, green pigeon, sand grouse are common. Near water spots common teal, snipes and occasional swarm of ducks are noticeable.

There is a Forest Rest House at Langdiamba and three others nearby at Pal, Mohamandali and Haripura.

Nagzira Sanctuary

This proposed sanctuary is in Tirora range of Bhandara district and covers an area of about 131.75 sq. km. The wildlife generally come across is tiger, panther, bison, cheetal, sambhar, barking deer, blue-bull, mouse deer, sloth bear and wild boar. Bird life too is diverse and abundant. The tanks of Nagzira and Thadezari add to the beauty of this area and attract the animals in quest of water to quench their thirst.

Bor Sanctuary

This proposed sanctuary would cover an area of about 61.19 sq. km. of the forest along Bor lake in Wardha district. This sanctuary will have a particular significance on account of its nearness to Wardha, where Mahatma Gandhi the apostle of peace and preacher of 'Ahimsa' spent a part of his life time.

Tansa Sanctuary

This proposed sanctuary will be in the catchment region of the Tansa lake which is well wooded land and covers an area of about 217.9 sq. km. Tansa lake with its limpid beauty heightens the attraction of this area. This sanctuary is served by two mecadamised roads, viz. Tansa-Agra road and Kharbi-Vaitarna road. Among the fauna commonly noticed in this area are panther, sambhar, cheetal, barking deer. The area is quite rich in bird life.

Kinwat Sanctuary

This proposed sanctuary is situated in Yeotmal and Nanded District and will cover an area of 138 sq. km. The animals seen are tiger, panther, blue-bull, wild boar, sloth bear, sambhar, cheetal, barking deer. Development works have not yet started and as yet it is not recommended for tourists.

Nature's Laboratory

These areas of Parks and Sanctuaries form nature's laboratory where the scientist can unravel the secrets of nature for the benefit of mankind. The Parks and Sanctuaries will recreate a lost world, alive once again with humming of insects, melody of birds, cries of animals resounding in the tranquil forests, creating a vision of beauty and unity unsurpassed.

The White Tigers of Bihar

By

KUNWAR SURENDRA SINGH

From the remote past the jungles of Bihar have been famous for wildlife and they were known to have many white tigers.

2. The origin and status of the white tigers is still a subject of dispute among experts. According to an American writer the white tiger is a true breed and is not to be confused with the albino. Some people hold that it is an albino, while others affirm that it is a mutant. A recent study of the pedigree and genetical analysis of eleven white-tigers—inmates of Delhi Zoological Park—has proved that it is a mutant.

3. There is an International White Tiger Club of people who are doing research on the subject. There are 26 white tigers in India out of 34 living white-tigers in the world, and India is exhibiting one at Expo '70 in Japan.

4. Records of big game indicate that in the past 40 years more than 20 white tigers were shot in the various jungles of this State. The last record of shooting of white tiger is that of a tigress in the Satgawan Forest of Hazaribagh district by some unknown shikari in the year 1958 and the trophy is kept at Tisri with H.C. Agrwala of C.M.I. Ltd.

5. Late Maharaja Bahadur Chandra Mauleshwar Pd. Singh of Gidhaur shot a 9'-8" white tiger in the Lachwar jungles of Gidhaur Raj (Monghyr) on 2nd February, 1932. Later on, this fully mounted trophy was presented to the Calcutta Museum by the late Maharaja. According to available records, the largest number of white tigers have been shot in the district of Hazaribagh (Bihar). Four white tigers were shot respectively by Mr. J.G. Wakefield, Manager, Tikari Raj, near Hazaribagh, in 1930, Raja Bahadur of Ramgarh at Itkhori Jungle, Shri Kartik Pd. Singh of Mashnodih in his own jungles and Tiket of Gawan late Krishan Pd. Singh at Bhaiya Bahini Pahar, Gawan. Besides this, in the year 1936 Kumar Fateh Singh of Tikari, shot one 10' white tiger at Searkorni jungle and one was shot by Mr. Torky, S.I. of Police, at Satgawan.

6. Two white tigers were shot by two Englishmen, Mr. Murphy and Mr. Robinson, in the jungles of Bhagalpur district and they find place in Rowland Ward's Big Game Records. Kumar Krishnanand Singh of Sultanganj has also shot one white tiger in Bhagalpur district. Mr. Shilinford shot one in Purnea district jungles in 1907 and the 3rd Raj Kumar of Amawan has shot another at Gurpa forest.

7. Late Maharaja of Tikari, Capt. Gopal Sharan Singh, shot two white tigers in 1926 and 1933 respectively in his own jungles of Gaya. The indiscriminate killing of wildlife

has led to a thinning out of big game in general and of white tigers in particular in the jungles of Bihar and it was feared that in a few years more this magnificent and rare animal would be extinct. But thanks to His Highness the Maharaja of Rewa, who, with great patience and incurring a huge expenditure, has pursued the breeding programme of white tigers at his Govindgarh Palace, the future generations will be indebted to him if they are able to enjoy a thrilling sight of white tigers in the country.

The Tiger of the Terai, with Special Reference to the Kheri Forests of Uttar Pradesh, India

By

ARJAN SINGH

Much has been written of the future of the tiger (*Panthera tigris*), but this magnificent predator has been studied chiefly over the sights of a rifle and a deal of wishful thinking has been mixed with false sentiment for his survival. The fact remains that this glamorous feline and prolific dollar earner, this flamboyant cat which has made India famous, is on the way out due to many and increasing pressures. He is going to disappear before we know the reason why, unless drastic and realistic measures are taken. Through the ages, the tiger has proved to be one of the most adaptable of the extant species. From the mastodonic era of the prehistoric sabre-tooth tiger, he has modified his form to his environment. From the bulky and long haired specimens of the Siberian tundra, to the lithe, dark animals of the steamy rain forests of Malaysia, he has colonised most of Asia. But now his back is to the wall. There is no place to go. Man has ascended to the moon, but is crowding the lesser creations from this planet. One cannot help asking in the words of an earlier writer the fateful question, "Quo vadis, *Panthera Tigris*?"

Before I proceed to particularize, I give figures from the International Union for the Conservation of Nature and Natural Resources, the international authority which is the guiding body of all the wild life conservation institutions of the world in international conservation schemes. It makes sorry reading but emphasizes the magnitude and urgency of the task.

We start with Persia, the westerly limit of the tiger: there are less than 20 left. From Persia we look north east to Afghanistan: there are no figures but there are probably close to a dozen, no more. East again to West Pakistan: a very depleted number. North to

southern Russia, to the shores of the Caspian where once the tiger roamed in great numbers: present numbers 60 to 70. And no more than this in North Korea and north eastern China, with the figures of southern Korea close to 50. In China no figures are available, as there are none for E. Pakistan or India, both countries where the numbers are considerably reduced. To the South East down through the east Asian peninsula: No numbers available for Burma or Malaysia or for Thailand, Cambodia or North and South Vietnam. In Sumatra all that is known is that the situation has seriously deteriorated. In Java 20 to 25 animals are left in the entire island, and in Bali wholesale destruction of the Balinese tiger has reduced the population to the present pathetic figure of four.

The tiger, unlike the lion, who is partly diurnal, is completely nocturnal. The lion is part of the landscape at the Kruger National Park, and prides may be seen on its metalled roads, and even chewing the tyres of stationary automobiles. The tiger has learnt to tolerate man due to force of circumstances, but not to live with him. Maneaters are a local aberration, but the average tiger of which I write, avoids man and his proximity if possible. It hunts during the hours of darkness and lies up during the day.

The terai forests of the sub-montane tracts of Uttar Pradesh bordering Nepal, have always provided the ideal habitat for the tiger. Towering sal trees (*Shorea robusta*) with dense secondary undergrowth in the winter, and heavy stands of narkul and elephant grass bordering marshy pools in the summer, for the tiger is extraordinarily intolerant of the sun and heat.

During the years of British occupation, into the 1920's and 30's, tiger shooting was the sport of a privileged few. The rules protecting them were adequate and strictly enforced. The tigers were largely game-killers, and the occasional head of cattle which was taken from among those which grazed permissively in the reserved Forests was part of an occupational risk for which no penalty was sought to be exacted. Licences for firearms were issued with circumspection, and crops did not impinge to any large extent on the boundaries of the forest. It was here that the tiger lived in solitude, heralded only by the alarm calls of the animals on whom he preyed and far from human habitation. I can recall my early hunting days when we were clearly instructed not to shoot at lesser game within two miles of likely tiger cover for fear of scaring the animal. His habitat consisted of dense forests and grassess well in the interior and every block had its resident tiger. No sooner was one killed than another took its place. The source of supply was the Kingdom of Nepal, where the natural home of the tiger was the forest clad foothills of the Churia Range, the second rampart of the Himalaya, where a rainfall of a hundred inches, towering trees and creeper-clad undergrowth, interspersed with swamp and marsh, shaded the ultimate and selective breeding grounds of the tiger. A seemingly inexhaustible supply which could produce 41 in a three-week-shoot by the Maharajah in 1933, and 120 in three months in 1939 in Chitawan.

This, then, was the picture upto the close of the second world war.

The last two decades have seen a revolution which is frightening in the magnitude of its impact. Man is on the march and whole species are threatened to be swept away in his lenthening stride. Can we save them ? The democratic set-up in Nepal has exploited the great virgin forests, and the woodman's axe re-echoes in the vast canopies where once the resonant roll of the tigers roar was the dominant sound. Colonisation has also taken place on a large scale, and Chitawan was able to produce only one tigress for the Duke of Edinburgh in the early sixties. With the abolition of feudal privileges the pressure on wildlife has increased greatly. The tiger has responded to this decrease in habitat and food supplies by migrating to the adjacent forests of India and this accounted for the vaunted surplus of the middle fifties and sixties, which the Indian Forest Department claimed as a success of its wildlife policies. Incidentally, this 'surplus' has been gleaned in the Western Circle of Uttar Pradesh, once the favourite hunting grounds of the dollar-avid shikar companies, who have now been moved to more lucrative and newer pastures in their barter of dollars for tiger-skins. Though no census figures for Nepal are available it is unlikely that the tiger exists to any large extent except in Kanchanpur-Kailali in western Nepal and Chitawan in central Nepal.

Jim Corbett, though better known as a hunter of maneaters, was our original conservationist. Writing in the fifties he gave the tiger another ten years of existence in India. Facts have belied his gloomy prognostications, but an extension of this decade as from now might well be an accurate forecast of the end. The pressures are simply too severe.

The forests of Uttar Pradesh comprise 13% of its land mass in place of a recommended 33%. This ideal can never be attained due to the pressure on land. The chief timber of these forests is the sal, a magnificent tree which reaches a height of 100 to 150 feet and a girth of 8 to 12 feet. Not being as a broad leaved as the teak it encourages secondary growth and shelters a variety of wildlife. It attains maturity in 150 years, and therefore its replacement is sought by exotic species like the eucalyptus, which attains maturity in 30 years or less, but will never offer effective shelter to wildlife owing to cyclic operations inhibiting secondary growths, early maturity and no shade capacity. These areas will for ever be denied to the tiger.

The most insidious effect on the tiger population has been the extension of cultivation to the edge of the forest. Licences for crop-protection firearms have been issued on a massive scale and these means have been used for poaching inside the forest. The decimation of his natural prey and shrinkage of his habitat has caused the tiger to follow the bony, scrub cattle that infest the forest for grazing into the fields. It finds temporary shelter in the fields of sugarcane, where it leads a precarious subsistence on the deer which are attracted by the young crops and on cattle. The pendulum has swung full circle and the creature of the deep

woods who shunned the proximity of man has come to terms with his destroyer. That this is a transitional state of affairs is obvious; as the crop-grazing deer are shot for meat or sale: in turn the cattle lifters skins find their way to foreign markets through devious means.

A large percentage of tigresses seem to favour sugarcane fields for dropping their April litters, when they threaten cane harvesters with dire reprisals. In the current year, five tigers were shot, eight cubs captured and three cubs burnt in sugarcane fields in the area of Pallia in Kheri District. These are known local figures, where such crimes are usually hidden and do not find a place in any statistics. There must be many more cases which do not see the light of day, and a considerable multiplication of such figures in the long border which the field has now with the forest. The impact on posterity is obvious. Shikaris roam the fields at all hours on tractors, scouring the sugarcane fields for the marauders they have created. It is all in the interest of crop-protection, food production and the many shibboleths which make man the dominant race.

There are no rules for shooting outside forest areas, and though a draft bill is ready to be presented to the legislature, this measure has been held up for the last three-and-a-half years, mists of yester-year. Rules inside the reserved Forests are adequate if implemented properly. But Shikar companies get favoured treatment and with professional know-how are able to kill their quota. There is no census governing this quota, and the cumulative impact on the surviving tiger population is clear and will become more so in the few remaining years.

The international forums of public opinion must endeavour to halt this tragic race of the the tiger, both India's and the world's legacy, to extinction. The Tal Mahal can be rebuilt marble upon marble, but to destroy an evolution of 200 million years will be among the major crimes committed by mankind in the fulfilment of his destiny.

The Dainty Muntjac or Barking Deer

Muntiacus (Cervulinus) muntjac (Zimmermann)

By

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The Muntjacs or Barking deer are small dainty Asian deer, 23 to 30 inches high, with stocky body, golden-brown or deep chestnut in colour, thin neck, very long bony pedicles covered with skin and hair above the frontal bone, and very small two-tined bony antlers which are shed from the pedicles and replaced every year, and tusk-like canines in the upper jaw. They belong to the sub-family Muntiacinae, in the family Cervidae of the order Artiodactyla, sub-order Ruminantia and infra order Pecora. They are ruminants and chew the cud like cervids.

Fossils: Little is known about the origin of muntjacs. The muntjac family is, however, older than other families of ruminants, dating back to the Lower Miocene epoch when there was abundant rain and lakes were full and forests were richly disposed with green pastures and variety of grasses. The muntjacs (*Cervulinus*) may be allied to the little hornless artiodactyl genus *Dremotherium* which is known from the European Miocene deposits. The *Dremotherium* seem to connect the oligocene Chevrotains (*Gelocus*, etc.) with later antlered Cervidae which reached the culmination of their development in the Pleistocene times.

Survivors: The living muntjac is larger than its fossil ancestor and has retained its primitiveness by the presence of high bony pedicles from which the antlers grow, the simple antler structure with only a brow tine, tusches in the upper jaw and solitary life. The growth of antlers in the young stag is typical of the evolution of the race. In one year old stag the antlers are just simple one pronged spikes, but in the successive years they are two-tined. The muntjacs are confined to Southern and Eastern Asia and adjacent Islands. They are absent in Africa South of Sahara.

Genus. The muntjacs consist of two genera:

1. Muntjac—also called Barking deer and Rib-faced deer. (*Muntiacus muntjak*, Zimmermann). They are found in India, Burma, Ceylon, Pakistan, Malaya, Java, Sumatra, Borneo, Formosa, Japan and China. In South India, the muntjac is named 'Jungle sheep' and 'Jungle goat' although it is unlike sheep or goat and non-gregarious.

2. Tibetan muntjac or Tufted deer (*Elaphodus cephalopus*, Miln-Edwards) with a shoulder height of 23 inches; weight about 40 lbs; brown in the fawn and dark brown in the adult and underside of tail white; tiny antlers (in the stag only) about one inch long, quite out of proportion to the length of the pedicles; and prominent tufts of hair between the ears (hence

the name). They occur in Burma, Tibet and China. They lack the face ridges. They move about singly or in pairs. Their mating season is April-May. Gestation period is 6 months. Only one fawn is delivered at a time. During the breeding season both stag and hind bark like the muntjac and at other times they bark when alarmed or scenting danger.

Races: There are three races of muntjac in India, the North Indian (*Muntiacus muntjak vaginalis*. Boddaert), South Indian (*M.m. aureus*. H. Smith) and Malabar and Ceylonese (*M.m. malabaricus*. Lydekker). All are similar in habit, living singly, or in pairs or in small parties in thickly wooded hills and ravines and feeding on grass, leaves, fruits and berries. The fawny yellow muntjac (*M.m. grandicornis*) occurs in Burma and the Black muntjac (*Muntiacus criniferus*. Sclater) is found in Chekiang, China. The smaller Chinese Reeve's muntjac (*Muntiacus reevesi*) and the muntjac of Tenasserim (*Muntiacus feae*. Thomas and Doris) are treated as distinct species.

Acclimatisation. During the beginning of the 20th century the large sized Indian muntjac (*M. muntjak*) and the smaller Chinese Reeve's muntjac (*M. reevesi*) were introduced in Woburn Abbey Park in Great Britain by the Dukes of Bedford. The escaped ones have spread over the neighbouring countryside and they are well acclimatised to temperate climate and thriving well. Crossings between the Chinese and the Indian species which escaped from the Park have occurred, giving hybrids of intermediate sizes and variations in colour. Hybrid muntjac which is a cross between muntjac and Tufted deer is also occasionally seen in Burma and China.

Habitat: The muntjac like the Sambar (*Cervus unicolor*. Kerr) is widely distributed all over India. Its habitat ranges from the better quality tropical moist deciduous forests to the semi-evergreen and wet evergreen forests along the Western and Eastern ghats, and the Nilgiri, Bababudan and Biligirirangan Hills from the plateau level of 2,500 to 8,000 feet, receiving rainfall from 60 to 350 inches and in the outer ranges of the Himalayas lying to the South of main axis upto a level of 5,000 to 8,000 feet and at times even higher. The muntjac prefers wooded hills, bamboo clad ravines and glades in the vicinity of streams (hence it is named Ravine deer).

Physical appearance: The muntjac is a small, elegant deer. Its body is long, thick and compact. Neck is short and thin. Legs are short, slim and slender and end in pointed, black hoofs. Eyes are small and when a torchlight is flashed they glow like emerald at night. Tail is rather long in proportion to the size of the animal. Ears are of moderate size and erect. Gall bladder or caudal gland is absent as in the deer but there are glands on each hind leg between the hooves.

Body colour: The body colour of the South Indian muntjac (*M.m. aureus*) is golden brown and that of North India and Karwar (*M.m. vaginalis*) is bright chestnut. Hinds and

fawns are a little paler in colour. In both the sexes chest, belly, the inside of the thighs, the undersurface of the tail, the lower abdomen and the chin and upper portion of the throat are white or fairly tinged with brown in some specimen. Naked portion of the muzzle is grey in colour. No dark stripe appears down the chin. Melanism, i.e., an all black colour is rare in muntjac and other deer. But *Muntiacus criniferus* of China is said to be considerably black in colour. Albino muntjacs apparently occur, but rare.

Coat: The coat is of soft, short flat-lying hair and has a sleek and shining look. Sebaceous and apocrine glands at the base of each hair shaft secrete an oily matter which make the skin gleam in the sunshine and water-proof. The fawn has fine, fluffy hair. The coat is cleaned by constant licking. In fact, the muntjac is a clean animal. It perspires through the skin (Cutaneous) but sweat is seldom seen.

Antlers: The antlers are solid bony outgrowths arising from the pedicles borne only by the stags. They are of brownish hue and short consisting of a short brow-tine arising at an acute angle from the axial stem or beam which grows for 3 or 4 inches. Antler tips are fairly smooth, polished and sharp and slightly curving inwards. Antlers are shed from the pedicles in May and June and produced anew by August. And in some individuals growth and shedding of antlers goes on all through the year. The growth and shedding is under the control of the male sex hormones. The pedicles 3 to 4 inches long, arise from the frontal bone, the front edge of which descend as ridges or bony ribs onto the whole length of the face. Due to the presence of these facial ridges or ribs the muntjac is called rib-faced deer. The hind lacks antlers but it is rib-faced and the facial ribs end in a small tuft of bristly hair, often having a warty core on the head in place of antlers.

Body weight and size: The full length of an adult stag from nose tip to tail tip is 4 feet. The shoulder height is 23 to 30 inches. The weight of stag is 48 to 50 lbs. and the hind is 15 lb. lighter and measures 3 inches less. Excluding the pedicle measuring 3 to 4 inches, the average Indian antlers are 3 to 4 inches in length measured round the outside curve. The maximum length recorded in old Central Province is 7 inches, girth $3\frac{3}{4}$ inches, tip to tip $3\frac{1}{2}$ inches; South India $6\frac{3}{4}$ inches; Berar $8\frac{1}{2}$ inches; and Burma 7 inches.

Skull and dentition: The skull is like any other bovine ruminant but there is a large fissure just in front of the eye-socket (Lachrymal fissure). Upper canine teeth or tushes (prominent in stags) are present (so too Musk deer and Mouse deer (*Moschus moschiferus*. Linnaeus and *Tragulus Meminna* respectively) bear these tushes, otherwise dentition is as in bovines. The stags are capable of inflicting severe wounds with these tushes. The tushes can slightly be erectile from the gums. In the upper jaw there are no incisors, but there are 3 pre-molars and 3 molars on each side. In the lower jaw on each side there are 3 incisors and a canine tooth (the canine tooth appears as the outermost incisor), 3 pre-molars and 3 molars. The dental formula is $I\ 0/3, C\ 1/1, Pm\ 3/3, m\ 3/3=34$. The presence of both tushes and antlers in the

species is unusual. The muntjac's tongue is extremely long. It can lick all over its face. The stomach is ruminant, having four compartments. Gall bladder is absent. (Gall bladder is present in Musk deer).

Scent glands: The muntjac has a peculiar mossy smell. It has a large well developed infra-orbital gland with a slit like opening located just below the inner corner of each eye. When the muntjac is excited, the gland is opened showing a shallow pouch with an oily tuft of hair at its lower end and shut at will. Hungry fawns in anticipation of nursing open their infra-orbital glands wide. The glands are well developed in the stag and are very active during the rutting season, when it challenges another stag intruding into its territory. The gland emits a strong musky scent, which is believed to attract and guide oestrous hinds to their mates. The muntjac has also a frontal gland on the forehead. Each hind leg has a gland between the hoofs. These leave a trail of scent during the movement of muntjacs and act as a means of communication among the muntjacs.

Genitalia. The genitalia of muntjac are like those of other deer. The udder is inguinal and has two small teats.

Senses: All senses are highly developed in the muntjac; it is keen of scent and quite alert to sight and sound. It can scent danger from afar upwind from it and locate food by scent. It often recognises a man at a considerable distance even if he stands still.

Voice: The muntjac is one of the most vocal of all deer in Asia. It utters several well-defined calls. Both the sexes give out a dog-like—not quite like—loud 'bark' of alarm or curiosity which echoes and re-echoes amongst the hills and dales, that is repeated, at intervals, several times (hence the name Barking deer) and especially if there happens to be a prowling tiger or panther or a pack of wild dogs (*Cuon alpinus dukhunensis*. Sykes) in the vicinity. This bark can be heard over a mile or two in the high forests and even over the soft noise of drizzling rain in the morning and evening and at midnight according to wind direction. The muntjac keeps on barking, often concealed in cover but keeping the trail of the predator in view. There seems to be a discernible difference in the call of the male and female. When startled and in flight the muntjac barks continuously in a cackling fashion. When it runs away it produces a peculiar clicking noise like that of castanet as its bark gets split up by its jerking motion at that time. During the rut the stags utter a mate call which is louder and hoarser than the usual bark of alarm, in the morning and evening and also at night. Communication between mother and fawn takes place by gentle murmuring calls and also by stamping with the feet.

Walk: The muntjac walks with a slow mincing and elegant gait, the head and neck jerking back and forth at each step and also lifting its feet up and placing them down again slowly and vertically. The gait of walk is rotatory. The rotatory sequence goes on like this: left fore foot; left hind foot; right hind foot; and right forefoot. When frightened the muntjac runs with

amazing agility and speed with head low and stern high and the tail raised exposing the white below and often with a succession of bounds (broad-jump, up to 12 to 15 ft.) and even negotiating rocky ground, dense thickets and tangled undergrowth. Despite its coloured skin it is difficult to spot a muntjac when it stands still under the shade of bushes.

Habits and behaviour: The muntjac moves about singly or in pairs or in small family groups. The stag dominates the family group. His mate and her fawn or an yearling follow him. The stag is pugnacious and fights at all seasons with other males. The young mature in a year and quit or driven out from the family.

Territory and seasonal movement: The muntjac confines itself to a selected territory (1 or 2 sq. miles) all its life. Its territory has enough feeding ground, water and preferably a 'salt-lick' not far away. Water is the critical factor that, along with cover, determines and controls the movement of the muntjac, both daily and seasonally. The muntjac moves about freely in the open on a rainy or drizzling or foggy day to escape drip from trees and also gadfly bite. It seeks shelter if there is a heavy rain storm. It is a selective feeder and seeks succulent vegetation in the lower slopes in the dry season. During the rainy season it has choice food and water within the forest cover it prefers and so remains in it.

Population: Due to the solitary and shy behaviour of the muntjacs and their territorial habit their population is not estimated in the high forests. The sex ratio seems to be 1 male: 1 female to 2 males: 1 female and 1/3 of the hinds with fawns.

Daily feeding: The muntjac is fairly diurnal in habit. It comes out to graze in the outskirts of forests. It grazes tender shoots of many grasses and browses palatable herbs and leaves. It is fond of bamboo leaves and bamboo seeds, leaves of mustard, *Hymenodictyon excelsum* and *Santalum album*, flowers of *Bombax malabaricum*, wild baubinia species, *Bassia latifolia* and *B. longifolia*, fruits of *Phyllanthus emblica*, *Careya arborea*, *Zizyphus jujuba*, *Gmelina arborea*, *Eugenia jambolana*, figs of *Ficus glomerata*, *F. mysorensis*, *F. benghalensis* and *F. tsela* 'salt-licks'. While feeding on the leaves on a twig just above it, its long tongue entwines the twig and pulls and strips the leaves off it. At times it stands on its hind legs to crop off twigs of saplings of *Santalum album*, *Bombax malabaricum* and *Hymenodictyon excelsum*. The muntjac feeds in the morning (sometimes upto 10 a.m.) and evening (as early as 3 p.m.) and keeping watchful for any lurking danger; resting during the hot hours of the day in some shady nook of the jungle and chewing the cud. It always drinks clean water from a running brook in the evening at an earlier hour than other deer. It visits 'salt-lick' regularly and eats the salt-saturated earth. It is said that it eats meat if readily available. But at no time have I seen it eating meat.

Resting: At night the muntjac is not so nervous and goes on feeding and at intervals takes rest and chews its cud, often in the open grassy glades or inside the bushes on hill-tops.

or slopes having a good view of the country below. The muntjac lies down by folding its forelegs under it first, then its hind legs. It gets up on its hind legs first when rising. It sits on its flank and turning its back to the wind. Sometimes it rolls onto its sides with legs stretched out, in relaxation. Even while dozing, it keeps alert and on the slightest alarm it rises and runs off. Normally, however, it gets up slowly, stretching its legs and arching its back stiffly, and then moves off.

Depositing faecal pellets: The muntjac deposits its faecal pellets in heaps in certain specified places. The pellets are oval with pointed ends in shape ($\frac{1}{4}$ inch in diameter and $\frac{1}{2}$ inch in length); dark green when soft but turn black and hard on drying.

Breeding: The breeding of muntjacs (Polygamous) is not well defined but it generally occurs in January-February. A superb muntjac stag stands on a mound in his territory and barks aloud as a challenge to other stags or as a summons to hinds who may be in his territory. The powerful odour of his scent glands (activated in mating time) is wafted in the air to attract the hinds. There or four rival stags from the neighbourhood which answer him and the hills and dales resound with echo with their challenging barks in the morning and after sun-set and at night. This is the time when the stags are in a truculent mood and their tiny antlers are fully grown. One of the rival stags emerges from the bushes and meets the challenger. They advance upon each other with their heads bent and scraping earth with their forehoofs. Their antlers meet. Each rival gives a couple of powerful pushes with his forehead. Antlers are not used much. If one stag feels the other is stronger than himself he simply quits the arena. But if they are equally matched, they keep on pushing and twisting and waving their tail the whole time. Once in a while they pull apart and stare and snort at each other in anger, and charge again. One may get a bloody nose and some gashes on his neck and shoulder. The fight goes on for some 20 minutes or so or intermittently the whole day and finally one of them yields to his rival and flees. The triumphant stag returns to greet 1 or 2 hinds present in his territory.

The muntjac hind during the mating season does react to the stimuli of the stag's summoning call and his scent and is sexually inclined to the stag who is also sexually motivated. But she exhibits no special behaviour when she is in heat or oestrus or when the stag is absent. She comes barking and gamboling along to a rutting stag and stays in his territory. The stag draws himself. He puts his head back, his facial glands everted, his nostrils raised, his neck swinging, and with slow, strutting steps he approaches his desired mate. She will be sitting aside or moving about nibbling grass. The stag understands that her heart is aflame. He goes near her, greets her, nose to tail, and sniffs her genitals. She gets up if sitting or gives up the grass if grazing and sniffs his body and even licks his face and neck. She moves off slowly and looks back at him timidly and stays a little beyond his reach. The stag too gets excited. He stirs her stamping the ground and pattering his forefeet and then gently chases her

for a while. When she is in peak of heat she stops and stands still in a soliciting posture. The stag approaches her rear, sniffs her vulva. She is tickled and squirts urine on his muzzle. He everts his lips from the upper gum holding his muzzle up and tests her scent in the usual bovine fashion and with characteristic gesture he mounts on her back by raising his forelegs and clasping her haunches and inserts the penis into the vagina and having effected this he stands erect and the copulation lasts half a minute or so. The stag then slides off, retracts the penis into the sheath and stands aside. The hind turns towards him and looks at his face lashing her tail in mild excitement and satisfaction for a while. Copulation takes place at a stretch 3 or 4 times at intervals of 5 to 20 minutes and again at longer intervals during the course of her heat period of about 24 hours. After the heat is subsided the hind is not inclined for further copulation. If the stag persists to mount her, she gives a flip of her slim haunches and he slides off and she moves on to nibble grass. Nubile hinds seem to be timid and shy and refuse to stand but an old one stands firm.

In this connection, it is worth while to note a few points:

1. Among muntjacs males fight for territory and the hinds it attracts.
2. A gallant stag stays in his territory and defends it and is ready to meet rivals. He may defeat them on several occasions and also likely to be defeated himself due to exhaustion. He may leave his post for water and feeding and on returning, he may find it occupied by another rival and must fight fiercely to regain his hold. These duels are more trials of strength and audacity than attempts to kill each other and in due course the weaker of the two concedes victory to his rival and runs off, leaving the hind to join the victor.
3. There is the physiological advantage in owning the territory as it reduces the incidence and severity of fight by his stern display of ear-lowering, eversion of facial glands or the show and his sharp tushes of the upper jaw.
4. While fighting, if a tiger or panther appears the contesting muntjacs cease fighting and seek safety until the predator goes away.
5. Owning of territory seems to arouse sexual desire in both the sexes.
6. The territorial habit during the mating season draws the most vigorous and valiant of the stags.
7. Copulation generally occurs within the territory, avoiding interbreeding. Genetic isolation is thus achieved and the best blood is passed on from one generation to the other.
8. Strict territorial urge happens to be seasonal in nature.

Conception and calving: The conceived hind stays with the stag in his territory and both of them develop an affection for each other and live together. They graze and sleep together

always. The gestation lasts 6 months. When about to calve the hind isolates herself and seeks some safe, secluded sheltered spot to deliver her young. She scrapes a bed with her fore-feet in the smooth grass. She feels restless with birth pains, and barks at times. She then lies down and begins to strain and heave and turn at intervals until the fawn or fawns are born. The fawn comes out with its head laid between out-stretched fore-legs. One or two pretty fawns as big as a hare are born at a time in June and July. The North Indian muntjac hind (*M.m. vaginalis*) has one young spotted with white for about six months. The spotted coat provides an effective camouflage in the dappled lighting of forest glades while the new-born fawn is still tottery and helpless. The South Indian muntjac hind (*M.m. aureus*) produces twins also at a birth. The fawns are neither spotted nor streaked with white. Fawns of both the races have no odour. Therefore the sniffing fox, wild dog or wild cat are baffled. The mother licks the new-born fawn clean from nose to tail-tip and brings it into warmth and stimulates its respiration and circulation of blood in its body and draws it towards her teats in the udder where her milk is waiting for it. The new-born fawn can stand up and even run about when only an hour or so old and skip along after its mother. The hind conceals the fawn in long grass or bushes where it lies quietly and almost invisible for about 10 days.

Daily the hind goes to graze near at hand and after feeding returns to her fawn to nurse it in the morning and late in the evening at 4 O'clock and keeps it clean by licking its body and anal region and helps it to defecate and nuzzles it down again. It is said that if the fawn is handled and touched by man leaving his scent on it its mother will desert it. It is not true. The hind is devoted to her fawn and man's smell does alter her nature. She just moves the fawn to a safer place.

On spotting a predator such as fox or wild cat the hind rushes to the fawn to defend it, against the predator. If the predator comes nearer the fawn she drives it off, striking with her forehoofs. If it is a leopard, she may distract its attention by prancing slowly in full view, so as to chase her.

After 10 days the fawn is able to run and leap and follow wherever its mother goes.

Growth of fawn: The fawn suckles for about 6 months and then takes up to adult food. It grows three quarters in 6 months and attains almost the adult size in one year.

Growth of antlers: In the stag in its first year two little hairy knobs called 'predicles' grow on the frontal bone of the skull to a height of 3 or 4 inches. They are not shed with the antlers, but remain an integral part of the bony structures. Soon from each pedicle which get fuzzy, the antler arises as a tender spike covered with thick, soft, hairy skin called

'Velvet'. The velvet has many blood vessels and is quite sensitive and easily injured. The stag safeguards it from damage. When the spike is fully grown with addition of living bone and hardens a bony ring or 'burr', at the base of the spike constricts and stops the flow of blood. The velvet dries and peels off. In the second year both the spike antlers fall off from the pedicles at about the same time and new antlers arise in their place. The newly-grown antlers send out a branch or 'brow-tine' from near its base and a simple beam, curving upwards and forward. The quality of the growth of antlers and their early shedding depends upon the good feeding conditions. Once a stag has produced its best head after several renewals it declines gradually. That is, the growth of antlers deteriorates with advancing age. Generally the cleansing and hardening of the antlers coincide with the start of rutting season. The infra-orbital scent glands are also well developed in the fawns of both the sexes. Their use declines with maturity in the hinds, while they are very active as a secondary sexual character in the maturing stags.

Breeding age: The minimum breeding age of both the sexes is 1 year. The yearlings leave the family and take up to an independent solitary life except during the mating season. The stags are capable of breeding when their antlers are fully developed. There are also instances of siring spike stags at less than an year old. The stags are pugnacious and do not tolerate the presence of another mature male and fight at any season. Stags breed even after the rutting season is over and there will not be frequent fighting among them. Some hinds reach sexual maturity at the age of 6 months. The exact timing of the first season (oestrus) of a maiden hind is not known and she shows no visible sign of her sexual heat. She may just wander in search of a stag. Some hinds adhere to no season of heat. They will come into their sexual season whenever they wean their latest off-spring, in whatever part of the year that may be, and will promptly seek a mate in his territory.

Span of life: The normal span of life of the muntjac is 10 or 12 years. In its natural state it is quite healthy and suffers no ailments. It may be tormented by some intestinal parasites which it gets rid of by eating the saltish earth in a 'salt-lick'. The muntjac is immune to the fell disease of rinderpest.

Predators: The muntjacs are attractive prey for predators like panther, tiger or a pack of wild dogs. Tiger and panther capture them through stealth—first stalking or ambushing, then pouncing—with a killing bite on the back of the neck or gripping the throat until the animal suffocates. The wild dogs (*Cuon alpinus duckhunensis*. Sykes) hunt in packs led by a leader and capture them by tracking and chasing. They generally attack them from the rear unlike the attack of a tiger or panther at the front. The stricken stag or hind at times takes to water to make good its escape from its pursuers. Often, when confronted it inflicts severe wounds to wild dogs with its sharp tusches. The wild dogs are well suited by their keen

sight and olfactory powers and by their long legs and deep narrow chest, to seek out and run down the fleetest prey with endurance. They run silently, but collect the pack by short 'yaps' to indicate the line when needed. They make the small prey defenceless at first, by running it to exhaustion. As the muntjac is seized by the leader, the pack members close in and quickly tear the prey to pieces. They eat flesh, skin, hair and bones. If the dogs happen to hunt by scent the muntjac often conceals itself in bushes and escapes.

During the monsoon muntjacs are menaced by the blood sucking gad flies and they come out to the open to escape them.

Relationship with other animals: The muntjac often associates with the swamp deer while feeding and also follows troops of monkeys and langurs to pick up the fruits and berries dropped by them from trees.

Muntjac and man: The muntjac is wary and shy of man. On seeing man, it jumps into hasty flight being frightened and seeks dense cover. It is often seen in beats for big game. It is regularly hunted and snared by poachers. It provides the world's finest venison. Of late, the race of muntjac is hardpressed in the wild and by those ruthless poachers. Their numbers are fast declining. Still the frequent killing of sturdy males has impeded their breeding, mating being left to younger males which come to rut late and upset the breeding season and give room to production of out-of-season fawns. The muntjacs need urgent protection from poachers.

Muntjac in zoos: The muntjacs thrive well in zoological gardens as seen in Mysore and breed fairly well and live a long time.

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रामायण के पक्षी

राजेन्द्रबहादुर सक्सेना, आई० एफ० एस०, उप-अरण्यपाल, उ० प्र०

महर्षि वाल्मीकि आदि कवि हैं, अतएव विश्व के समस्त कवियों के गुरु हैं। इनकी 'रामायण' आदि काव्य है। यह समस्त काव्यों की बीज कही जाती है—'काव्य-बीजं सनातनम्' (बृहद्धर्म पुराण १।३०।४७)। इसमें संदेह नहीं कि आदि कवि ने किसी प्राचीन काव्य को बिना देखे, किसी ग्रन्थ का बिना सहारा लिए श्रेष्ठ काव्य 'रामायण' का निर्माण किया। इसमें प्राकृतिक चित्रण तो सुन्दर है ही, संवाद अत्यधिक सुन्दर हैं। बालकाण्ड २।३, ४ में उल्लिखित तमसा नदी के किनारे महर्षि वाल्मीकि का आश्रम था। श्रीराम के बनवास के समय वह चित्रकूट (जिला बांदा, उ० प्र०) के समीप रहते थे।

मुनयश्च मेहात्मानो वसन्तस्मिञ्जलोच्चये ।
अयं वासो भवेत् तात वयमत्र वसेमहि ॥
इति सीता च रामश्च लक्ष्मणश्च कृताञ्जलिः ।
अभिगम्याश्रमं सर्वे वाल्मीकिमभिवादनम् ॥
(वाल्मीकीयरामायण अयोध्याकाण्ड ५६।१५-१६)

[इस (चित्रकूट) पर्वत पर बहुत से महात्मा मुनि निवास करते हैं। तात! यही हमारा वासस्थान होने योग्य है। हम यहीं निवास करेंगे। ऐसा निश्चय करके सीता, राम और लक्ष्मण ने हाथ जोड़कर महर्षि वाल्मीकि के आश्रम में प्रवेश किया और सबने उनके चरणों में मस्तक झुकाया।]

रामायण अत्यन्त लोकप्रिय काव्य है। महर्षि वाल्मीकि ने प्रकृति वर्णन में 'पक्षियों' का भी वर्णन किया है, किन्तु इतने विशाल काव्य में नाम से वर्णित पक्षियों की संख्या कम प्रतीत होती है। बहुधा 'पक्षी' अथवा 'पक्षी-गण' शब्दों का प्रयोग पक्षियों का बोध कराने

के लिए किया गया है जैसा कि निम्नलिखित उदाहरणों से स्पष्ट है।

स्निग्धपत्रा यथा वृक्षा यथा क्षान्ता मृगद्विजाः ।
आश्रमो नातिदूरस्थो महर्षेर्भावितात्मनः ॥
(वा० अरण्यकाण्ड ११।७८)

[यहां के वृक्षों के पत्ते जैसे मुने गए थे वैसे ही चिकने दिखाई देते हैं तथा पशु और पक्षी क्षमाशील एवं शान्त हैं। इससे जान पड़ता है कि उन भक्तीत्मा महर्षि (अगस्त्य) का आश्रम यहां से अधिक दूर नहीं है।]

अत्रोघानानि शून्यानि प्रलीनविहगानि च ।
न चाभिरामानारामान् पश्यामि मनुजर्षभ ॥

(वा० अयोध्याकाण्ड ५६।६)

[नरश्रेष्ठ! अयोध्या के उद्यान भी सूने हो गये हैं, उनमें रहने वाले पक्षी भी कहीं छिप गए हैं। यहां के बगीचे भी मुझे पहले की भांति मनोहर नहीं दिखाई देते हैं।]

रुदन्तमिव वृक्षैश्च ग्लानपुष्पमृगद्विजम् ।
श्रिया विहीनं विध्वस्तं संत्यक्तं वनदैवतेः ॥

[वा० अरण्यकाण्ड ६०।६]

[वह स्थान वृक्षों (की सनसनाहट) के द्वारा मानो रो रहा था, फूल मुरझा गए थे, मृग और पक्षी मन मारे बैठे थे। वहां की सम्पूर्ण शोभा नष्ट हो गई थी। सारी कुटी उजाड़ दिखाई देती थी। वन के देवता भी उस स्थान को छोड़कर चले गए थे।]

तथापि मयूर, चक्रवाक, हंस, गिद्ध, आदि पक्षियों का उल्लेख उचित स्थानों (घटनास्थलों) पर घटनाओं के

अनुरूप हुआ है। श्रीमद्वाल्मीकीयरामायण में निम्नलिखित पक्षियों का नाम से उल्लेख हुआ है। ये सभी पक्षी (गुरु के अतिरिक्त) बांदा के आसपास पाये जाते हैं।

१. गृध्र (गिद्ध, गीघ)

गृध्र [अरण्यकाण्ड १४।१, १४।१६, २३।६, ४६।३६, ५१।३, ५१।५, ६७।११, ६८।१, ६८।१५, ६८।१६, ६८।२२-२३, ६८।२५, ६८।३०, ६८।३६]

किष्किन्धाकाण्ड ५६।१८, ५६।२०, ५७।२, ५७।४, ५८।१२, ५८।२८, ५६।१, ५६।१६

सुन्दरकाण्ड २६।२४

युद्धकाण्ड १०।२०, २३।११, ५४।६, ५७।३७, ५८।३१, ६५।४४, ६७।१४, ६६।४२, १०६।२२, १०६।२७, १०८।११, १२६।२६, १२६।३३]

गृध्रराज [बालकाण्ड ३।२१]

अरण्यकाण्ड ५०।४, ५१।४, ५१।२०, ५१।४०, ६७।११, ६७।२१, ६७।२७, ६७।२६, ६८।३५, ६८।३६, ६८।३७

किष्किन्धाकाण्ड ५६।६, ५६।१३, ५६।१७, ५७।६, ५८।१-२, ६४।१

सुन्दरकाण्ड २६।१८, ३५।६४

युद्धकाण्ड २०।२७, १२६।४२]

महागृध्र [अरण्यकाण्ड ५१।४३, ५२।१, ५३।५]

जटायु [बालकाण्ड १।५३-५४]

अरण्यकाण्ड १४।३५, १५।१६, ४३।५१, ४६।३८, ४६।४०, ५०।१, ५०।४, ५१।५, ५१।३७, ५१।३८, ५१।४४, ६७।१०, ६७।१४, ६७।२८, ६८।४

किष्किन्धाकाण्ड ५६।२, ५६।१२, ५६।१४, ५६।६, ५६।१६, ५६।२३, ५७।६, ५८।२, ५८।५, ५८।८, ५८।६, ५८।११, ६०।२०, ६१।३, ६१।१४-१५

सुन्दरकाण्ड २६।१६, ३५।६३

युद्धकाण्ड २०।२७, १२६।२६]

सम्पाति [किष्किन्धाकाण्ड ५६।२, ५८।१, ५८।३६, ६०।२०, ६३।१३, ६४।२

सुन्दरकाण्ड ३१।१४, ३५।६४

युद्धकाण्ड १२६।४२]

सुपाश्व [किष्किन्धाकाण्ड ५६।८]

२. कौञ्च

[बालकाण्ड २।६, २।१४-१५, २।२६]

अयोध्याकाण्ड १०।१२, ५०।२६, १०३।४३

अरण्यकाण्ड १६।१६, ३५।१८, ७३।१२

किष्किन्धाकाण्ड १।६६, २७।२३, ३०।५३, ५०।१५, ५८।२७

सुन्दरकाण्ड ३।११

युद्धकाण्ड ४।८३, १२।३३

उत्तरकाण्ड ७।३३]

३. हंस

हंस [बालकाण्ड ३५।८]

अयोध्याकाण्ड १०।१२

अरण्यकाण्ड ११।३६, १४।१६, १५।१३, १६।८, ३५।१८, ७३।१२

किष्किन्धाकाण्ड १६३, २७२१, २८१६, ३०४२,
३०४८-४९, ३०६३, ४३१२२,
४३१३४, ५०१५, ५२१२२,
५८२६

सुन्दरकाण्ड २१२२, ७१७, ६१३५, ६१४८, १४१२४,
१७११, ५७१३

युद्धकाण्ड ५८१३१-३२, १२२१२६, १२३११

उत्तरकाण्ड १८१५, १८१३०, १८१३३, ३११२१-२२,
४२१२२, ७७१११]

राजहंस [अरण्यकाण्ड १११६
सुन्दरकाण्ड ३१११ १८११४]

कलहंस [अरण्यकाण्ड १११६, १४११६
किष्किन्धाकाण्ड ३०१६]

४. सारस

[बालकाण्ड ३५१८

अयोध्याकाण्ड ५०१२६

अरण्यकाण्ड १११६, १६११६, ३५११८

किष्किन्धाकाण्ड १३१८, २७१२१, ३०१५, ३०१७,
३०१४०, ३०१४२, ३०१४७, ३०१६३,
५०११५, ५२११२

सुन्दरकाण्ड १४१२४

युद्धकाण्ड ३६१११, ५८१३१-३२

उत्तरकाण्ड ३११२१, ४२११२]

५. शुक (तोता)

शुक [अयोध्याकाण्ड १०१२२

किष्किन्धाकाण्ड २८१२४

उत्तरकाण्ड ४२११२]

कीरक [अरण्यकाण्ड ७५११२]

सारिका [अयोध्याकाण्ड ५३१२२
युद्धकाण्ड १०६१३१]

शारिका [युद्धकाण्ड ३५१३२]

६. मयूर (मोर)

मयूर [अयोध्याकाण्ड ५४१४०, ६११७०

अरण्यकाण्ड १५११४, ७५११२

किष्किन्धाकाण्ड ११३६, ११३८-३९-४०, २७१२३,
२८१२१, २८१२८, २८१३४,
२८१३७, ३०१४०

सुन्दरकाण्ड ११११५-१६

उत्तरकाण्ड १८१५, १८१२२, १८१२४-२५]

वह्नि [अयोध्याकाण्ड १३११०, ५२१३, २८१४०

सुन्दरकाण्ड ३१११, ४१८

युद्धकाण्ड ३६११६]

शिखि [किष्किन्धाकाण्ड २८१२६-२७]

नीलकण्ठ [किष्किन्धाकाण्ड २८१३३]

७. इधेन (बाज)

[अयोध्याकाण्ड १२१४३

अरण्यकाण्ड १४११६

किष्किन्धाकाण्ड ५८१२८

युद्धकाण्ड २३१११, ६६१४२

उत्तरकाण्ड १५१५]

८. कपोत (कबूतर)

कपोत [अयोध्याकाण्ड १२१४३, ११६१६

किष्किन्धाकाण्ड १३१२३

युद्धकाण्ड १८१२४-२५, ३५१३१]

चान्ये [किष्किन्धाकाण्ड ५८१२६]

६. उलूक (उल्लू)

[अयोध्याकाण्ड ११।१२
अरण्यकाण्ड १४।१८
युद्धकाण्ड १७।६]

१०. कुरुर

[अरण्यकाण्ड ७३।१२
किष्किन्धाकाण्ड ३०।५६, ३०।६३, ५२।१२,
५८।२७
युद्धकाण्ड ३६।११]

११. गरुड

गरुड [अयोध्याकाण्ड ४७।१७
अरण्यकाण्ड ३५।२८, ३५।३१
किष्किन्धाकाण्ड ६७।२७
सुन्दरकाण्ड १।३४, १।२२
युद्धकाण्ड १।३, ५०।४१, ५०।४६, ६६।६,
१०२।४३, १०३।२२, १०८।१२,
१२५।२०
उत्तरकाण्ड ७।३८-३९-४०, ७।४७, ८।१७,
३४।१५, ३४।१७]

वैनतेय [किष्किन्धाकाण्ड ५८ २६, ६६।४, ६७।१४, ६७।२३
सुन्दरकाण्ड ३६।२६, ५१।२४
युद्धकाण्ड ५०।३६, ५०।३९, १००।५३
उत्तरकाण्ड ६।६६, ८।१८]

सुपर्ण [अरण्यकाण्ड ३५।१४
किष्किन्धाकाण्ड १६।२५, २८।४१, ५८।३१
सुन्दरकाण्ड १।७५, २०।२६
युद्धकाण्ड २२।८५, ५०।३८, ५०।५६, ६७।१७३,
७१।१०७-१०८, १०२।२५-२६
उत्तरकाण्ड ६।६६-६७, ६।६६]

ताक्ष्याय [सुन्दरकाण्ड ५७।१०]

पक्षिराज [सुन्दरकाण्ड १।३३, १।८०]

विनतासुत [सुन्दरकाण्ड ४२।४०]

पतत्रिराज [सुन्दरकाण्ड ४७।३४]

युद्धकाण्ड १८।३६, ५०।४५]

विहगेन्द्र [युद्धकाण्ड १२५।२१]

विष्णुरथ [उत्तरकाण्ड ७।३१]

१२. कारण्डव (जलकुक्कुट)

कारण्डव [अयोध्याकाण्ड १०३।४३
अरण्यकाण्ड ११।३६, ५०।१३
किष्किन्धाकाण्ड १।६३, १।६३, १।६८, १।३।८,
३०।४०, ४३।२२
सुन्दरकाण्ड २।१२, ५७।२
युद्धकाण्ड ४।८३
उत्तरकाण्ड ३।१२।१]

जलकुक्कुट [अयोध्याकाण्ड १०३।४३
किष्किन्धाकाण्ड १।३।८
उत्तरकाण्ड ३।१२।१]

१३. टिट्ठिभ (टिट्ठिहरी)

[अयोध्याकाण्ड ५४।४३
अरण्यकाण्ड ७५।१२]

१४. प्लव (जलकाक)

[अरण्यकाण्ड ७३।१२
किष्किन्धाकाण्ड १।६६
युद्धकाण्ड ४।८३]

१५. वज्जुल

[अरण्यकाण्ड ६६।२३
किष्किन्धाकाण्ड १।३।८]

१६. चक्रवाक (चक्रवा, सुरखाव)

चक्रवाक [अयोध्याकाण्ड १०३।४३
अरण्यकाण्ड ११।३६, १४।२०, १५।१३]

किष्किन्धाकाण्ड १।६५, १।६८, १।३।८, २।७।२०,
२८।१६, २८।३६, ३०।१०,
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१७. भास (चील)

[अरण्यकाण्ड १४।१८

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१८. कङ्क

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१९. कादम्ब (जलकाक)

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२०. मृगराज

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२१. कोणालक

[युद्धकाण्ड ३६।११]

२२. कुक्कुट

कुक्कुट [अयोध्याकाण्ड ६१।७०

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२३. कूकल

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२४. वायस (कोवा)

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२५. दात्यूह (पपीहा)

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नत्यूहस्तसंघुष्टा [सुन्दरकाण्ड १४।२४]

२६. चातक

[युद्धकाण्ड १००।४७]

२७. कोकिल (कोयल)

कोकिल [अयोध्याकाण्ड ५२।२, ५४।४३

किष्किन्धाकाण्ड १।२८, १।३२

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कोकिला [युद्धकाण्ड ३६।१०]

पुंस्कोकिल [अयोध्याकाण्ड १०३।४३]

२८. वक

वक [अयोध्याकाण्ड १०३।४३]

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कूट [किष्किन्धाकाण्ड २८।२०]

२९. कौयण्टि

[युद्धकाण्ड ३६।६]

३०. शतपत्र (कठफोड़वा)

[अरण्यकाण्ड ७५।१२]

३१. कुलिङ्ग (गौरेया)

[किष्किन्धाकाण्ड ५८।२६]

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234.	Survival Service Commission, I.U.C.N. Supplementary Paper No. 14 (Endangered Mammals of the World) ...	-do-
235.	Landscape Planning—I.U.C.N. Supplementary Paper No. 16	-do-
236.	Wild Life in India—Its Conservation and Control ...	Donated by the Author Mr. P.D. Stracey
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239.	The Reptiles (Time/Life International) ...	-do-
240.	The How and Why Wonder Book of Wild Animals ...	-do-
241.	The How and Why Wonder Book of Birds ...	-do-
242.	Maharashtra State Forest Centenary Souvenir, 1847-1947 ...	Presented by Mr. Hari Dang
243.	Maut ki Mand Men (in Hindi) ...	Purchased
244.	Bound copy of CHEETAL (Vols. 10 and 11) ...	From the Society
245.	National Wilderness Preservation Act—Hearings before the Committee on Interior and Insular Affairs, United States Senate, Part 2 (1959) ...	Complimentary

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1	2	3
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250.	Hunting the Desert Whale by Erle Stanley Gardner ...	
251.	Safari by Armand Denis ...	
252.	Extinct and Vanishing Birds and Mammals of India by Ajit K. Mukerji ...	
253.	Curiosities of Bird Life ...	Purchased
254.	Sunlit Waters by Capt. C.W..WS. Conway ...	-do-
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256.	Wild Life in India—Its Conservation and Control ...	Complimentary
257.	The Twilight of India's Wild Life by B. Seshadri ...	-do-
258.	I.U.C.N. 10th General Assembly and 11th Technical Meeting—Tcchnical Papers—First Sessoon ...	Donated by the Author Mr. B. Seshadri
259.	I.U.C.N. 10th General Assembly and 11th Technical Meeting—Technical Papers—Second Session ...	Complimentary
260.	I.U.C.N. 10th General Assembly and 11th Technical Meeting—Technical Papers—Third Session ...	-do-
261.	I.U.C.N. 10th General Assembly and 11th Technical Meeting—Technical Papers—Fifth Session ...	-do-

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262.	I.U.C.N. Publication New Series Supplementary Paper No. 17—'Conservation in India—Proceedings of the Special Meeting of the I.B.W.L. on 24-11-1965	... Complimentary
263.	The Vedanthangal Sanctuary for Water Birds	... -do-
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266.	Saving Natural Areas	... -do-
267.	Wild Life Sanctuaries of Rajasthan	... -do-
268.	Nehru Zoological Park, Hyderabad, A.P.	... -do-
269.	Wild Life of Uttar Pradesh	... -do-
270.	Wild Life, Orissa, 1969	... -do-
271.	Conservation of Nature and Wild Life in India	... -do-
272.	Bharat Ke Vanya Pashu	... Purchased
273.	Elephant, Lord of the Jungle	... -do-
274.	Our Animals	... -do-
275.	Hints on Tiger Shooting	... -do-
276.	Blasting Guide	.. Presented by the Author Shri N.K. Jain
277.	The Felines (Translation of Hindi 'Singh Parivar')	... Complimentary
278.	World Wildlife Fund, Year Book, 1968	... -do-
279.	Planetary Planning	... -do-
280.	Astronomy in Science and in Human Culture	... -do-
281.	Under Two Masters by N.B. Banarjee	.. Purchased

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1	2	3
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284.	Conservation in India—Proceedings of the Special Meeting of the Indian Board for Wild Life held on 24-11-65 (I.U.C.N. Supplementary Paper No. 17) ...	-do-
285.	Marine Turtles (I.U.C.N. Supply Paper No. 20)	-do-
286.	Report to the Govt. of Ghana on the Reorganisation of the Department Game and Wild Life ...	-do-
287.	Landscape Planning—A Policy for an Overcrowded World ...	-do-
288.	Ecology and Management of Wild Grazing Animals in Temperate Zones ...	-do-
289.	I.U.C.N. Supplementary Paper No. 19 (in French)	-do-

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STUDENT MEMBERS:

61 Student Members.

Book Reviews

The Twilight of India's Wild Life By B. Seshadri, Oxford University Press, 1970. (Rs. 45/-)

Once again, and perhaps more poignantly than in Gee's classic, the rapid decline, in wildlife populations and the extent and quality of their natural habitat, is brought into the limelight in this excellent little book.

Though, of necessity, Sri Seshadri has to go over the same ground, the very objective and forceful manner in which he does it more than justifies his labours. The unique contribution of this book is the attention it is likely to rivet upon the irreversible process of 'development' which in its present, thoughtless form, is bound to do irretrievable damage to the environment and habitat of India's wildlife, and indirectly to our human population.

Hydro-electric projects, dams and barrages, road-construction programmes are, indeed, great disturbers of the balance of nature, and Sri Seshadri, himself a civil engineer now settled in Britain, does pioneer work in highlighting this aspect so far ignored. To quote,

"The pattern and modus operandi of the dam projects is now a familiar one. Many thousands of men suddenly appear where there had been no substantial human colony. All around vegetation is rapidly felled for fuel and lumber. As the animals are exposed, they are killed by camp-following shikaris who sell the meat to the labour force, and by the project staff who begin to get a taste for casual sport."

Dams create lakes and reservoirs which submerge some of the best riverain flatlands and grassy areas, as in the case of the Ramganga project in Kalagarh, which will submerge almost one thousand out of the total of 1600 acres of the Ramganga flats, which are the favoured habitat of animal concentrations.

The new-era 'sportsman', generally officials, contractors' men, others, who travel in jeeps at night on forest roads, and shoot with spotlights are brought in for well-merited condemnation.

The Asiatic lion, and other threatened animals cannot survive unless states governments wake up. With only 10% of our land area under genuine forest, there is no scope for deforestation even for refugee resettlement schemes.

Though we, who live in India and not in Britain, and do our bit to ensure survival of the wilderness, will not agree with Sri Seshadri's pessimism, however justified, knowing that things are finally happening in this field with government support, there is no gain-saying the very great value of this interesting book as a record of past blunders. Ban on the shooting of tiger is being seriously considered in all states, and national parks and sanctuaries are getting a gingering up with the help of the tourism and forest departments, and Sri Seshadri

will find great improvements when he returns for a visit to India, as I am sure he would like to one day.

The photograph of Naga tribals' hunting of tigers and many other pictures in the book are memorable. An excellent little book for the laymen and the amateur, and a must for conservationists.

— Editor.

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National Parks: By K.S. Sankhala (Wild Life Preservation Society of India, 1969).

Here is another little book published by the Society. It will serve as a useful guide to thinking on national parks. Based on the study tour by Sri Sankhala, who is currently a Nehru Fellow studying tigers, of national parks all over the world, sponsored by the UNDP, FAO, Tourism department and others, it gives the detailed background of the national park movement in the world. The chapters on Indian sanctuaries and parks are extremely useful, and the author and the Society deserve full credit for the venture.

The book is profusely illustrated with fifty photographs in black and white and the cover page in colour. It is a must for every nature lover's desk and for every tourist, intending to visit Indian National Parks and Sanctuaries.

—Editor.

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Wild Life in India: Its Conservation and Control: By P.D. Stracey, I.F.S. (Retd.) 1963.

Here is an outstanding pioneer work by one of the founders of the Indian conservation movement, and himself a distinguished forest officer of the old school, who established fine traditions.

I have had the good fortune to read all of Sri Stracey's books, which include such volumes as *Elephant Gold*, *Tigers and Reade: Elephant kunter*. I can say without reservation that this is his best. A unique contribution, in fact the sheet anchor of all conservationist thinking in India. Sri Stracey clears new ground and gives a masterly exposition of all problems and policies.

It is such a pity that this book, completed in 1963 when the author was Director of Forest Education at the F.R.I., should have reached the market seven long years later. Meanwhile, much of the material has been overtaken by recent developments, but the book has more than transient value. It is the source book from which have been derived all other books, not excluding the best-sellers of Indian wild life.

One can only hope that when this small first edition is exhausted, the author will find time to revise it and re-publish his views and comprehensive knowledge in another edition. It would be yeoman service to the cause.

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**Wilderness and Planty: The Reith Lectures: By Dr. Frank Fraser Darling,
B.B.C. and O.U.P. 1970**

Commemorating Lord Reith, the Director General of the British Broadcasting Corporation during its difficult years, and its glorious war-days, the series could never have had a more fitting speaker than Dr. Darling, whose pioneer work on the ecology of the Red Deer, and other conservation studies, will long be remembered as the foundation of this new science.

Beginning with Man and Nature, Dr. Darling explains his views on this urgently needed novel field of study, because of the increasingly damaging impact of man upon his natural environment. Over the ages since man first appeared on the planet earth, he has drastically altered the balance of nature, and especially now, is doing so at an accelerated pace with all the tools of a destructive technology which threatens all life on earth. Fire and water and excessive population are the horsemen of the apocalypse; they threaten the God-given plenty with blight, and the technological exponential, next treated, can only be controlled if all planning is geared to the science of not just economics, but of ecological economics, which takes into account our bank balance with nature. Global changes in these fields, actual and possible are next dealt with, with the tone of a new prophet proclaiming not Christ but the Crucifixion of the entire human race at the altar of pollution, oil, chemicals, imbalance and biotic suicide.

But Dr. Darling is a human man, of deep understanding, and in the forefront of the very Forward Look in Conservation which he preaches and offers as our only hope. Who is responsible for these considerations is the problem with which he ends this pathetic series of talks which are now being published in book form.

—Hari Dang

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World Wildlife Fund, Indian National Appeal, Newsletters No. 1 and No. 3:**By Zafar Futehally, C/o. B.N.H.S., Bombay**

Finally, it seems, the Indian conservation movement is airborne. This reviewer is most impressed with the purposeful excellence of these newsletters, which detail the work done and projected.

Funds for the Indian National Appeal have begun to come in, from enlightened industrial houses, and individuals, and there is every hope that we have passed the point of no return. We may lose wildlife still, but it will not be for neglect.

—Hari Dang.

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| 5. Student : | 50% of Ordinary Membership Fee. |
| 6. Family :
(Applies to 2, 3 and 4 above) | 50% of Ordinary Membership. No Entrance Fee. |
| 7. Affiliated :
(Other similar bodies) | Twice Ordinary Membership. No Entrance Fee. |
| 8. Institutional :
(Messes, Units; Schools, Colleges,
etc.) | } Five times the Ordinary Members, i.e., Rs. 60.00
with 5 votes. No Entrance Fee |

The Wild Life Preservation Society of India

To Members,

There are many people who have the interests of Wild Life Conservation at heart but in these difficult days are not able to do as much for the cause during their lives as they otherwise might.

It is, therefore, considered that a Form of Bequest might appeal. Such a form is, therefore, now inserted in our Journal and the attention of members is respectfully invited.

Any sums received will be wisely expended in measures calculated to conserve wild life.

FORM OF BEQUEST

I give and bequeath the sum of..... unto the Wild Life Preservation Society of India, Dehra Dun and I declare that the receipt of the Honorary Secretary and Treasurer of the said Society shall be sufficient discharge for the said sum.

Signed.....

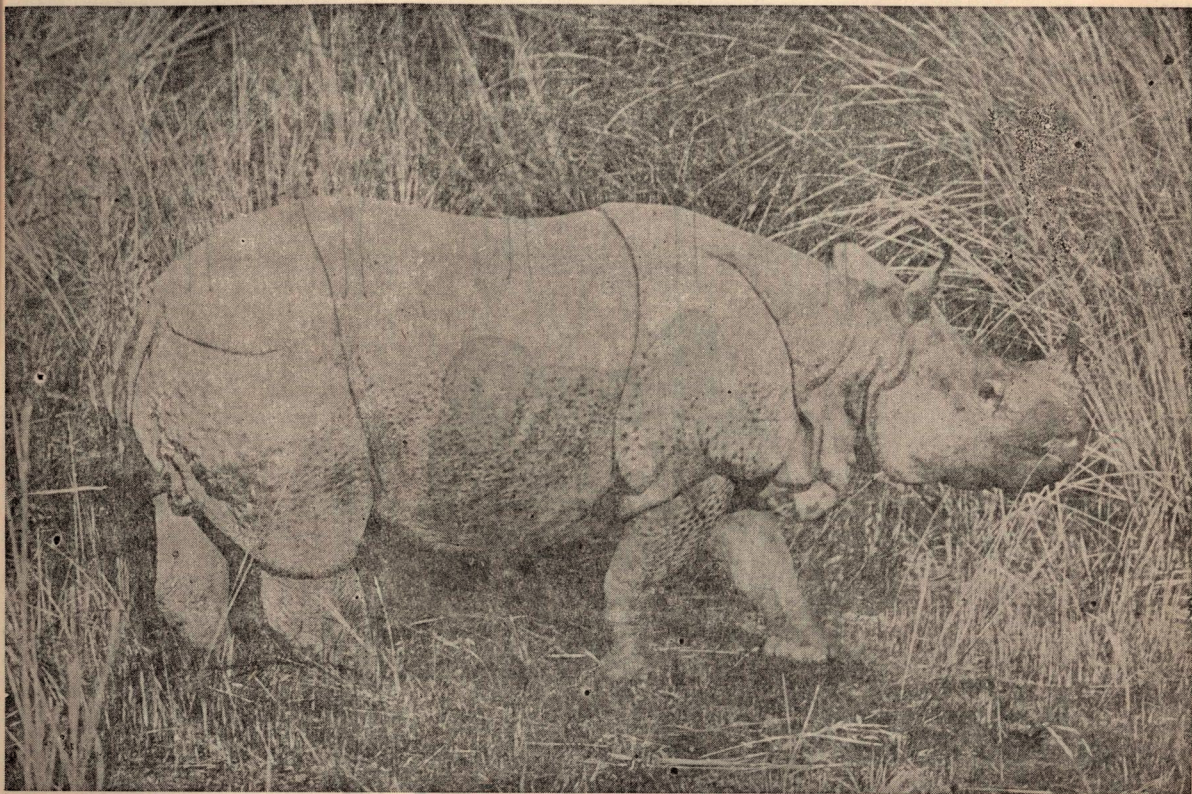
Address.....

Witness :

Name.....

Address.....

Occupation.....



Welcome to :

JALDAPARA WILD LIFE SANCTUARY

Best time to visit—NOVEMBER to APRIL

Situation—Alipur, Jalpaiguri District, West Bengal.

Scenic Beauty—River Torsa with nine Tributaries flows through the riverine forest of the sanctuary.

Wild Life Attraction—See the world famous Indian one-horned Rhinoceros in natural habitat and also elephants, Royal Bengal Tigers, Panthers, Bison, Sambhar, Cheetal and India's National Bird—the Peacock and a variety of Bird Life.

Area—Thirty-six sq. miles near Bhutan border.

Railway Station—Hashimara—only two km. from Tourist Bungalow, Barodabri.

Air Strip—Hashimara, Bi-weekly Air Service from Calcutta. Motor from Cooch Behar or Bagdogra on Air Service from Calcutta.

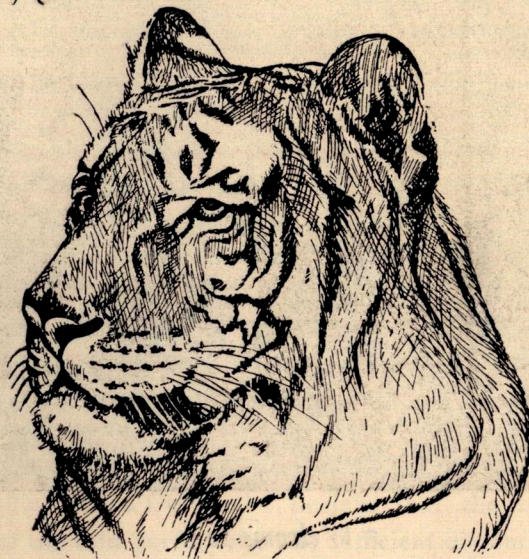
Forest Department Jeep and Elephants available to tourists on hire.

Accommodation—Modern Tourist Bungalow with catering arrangements at reasonable charges of Rs. 15/- per day per person inclusive of Lodging, Bed Tea, Breakfast, Lunch, Afternoon Tea and Dinner.

**Information and Reservation from :—THE DIVISIONAL FOREST OFFICER,
Cooch Behar Division, P.O. Cooch Behar (W. Bengal),**

Telephone:—Cooch Behar 27.

**LAND WHERE BIRDS SING
AND TIGERS ROAR**



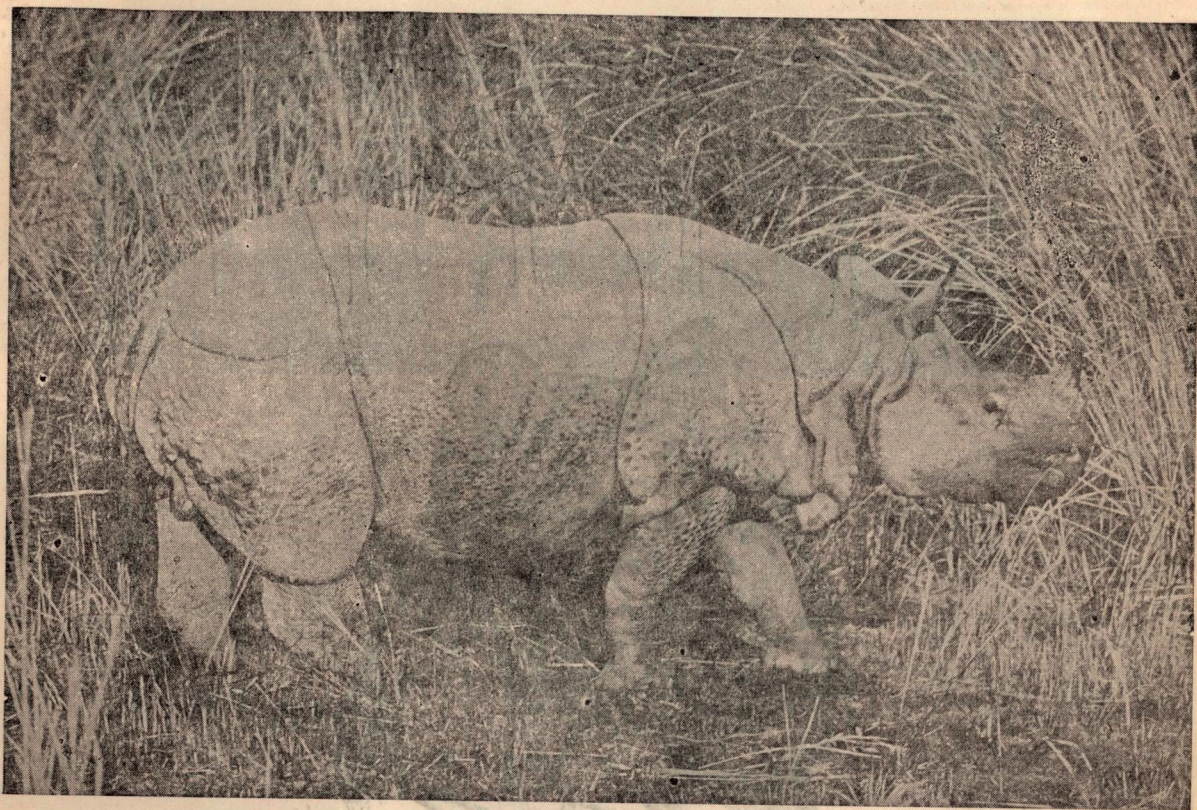
CORBETT NATIONAL PARK

Situated in the Foothills of Himalayas - 180 Miles from Delhi. Connected by Rail & Roads; Tiger; Elephant; Deer Species; Panther; Sloth Bear; Crocodiles; Colourful & Song Birds; Vast Savannahs; Picturesque Landscape; Healthy Climate; Mahaseer Fishing; Electricity; Running Water; Sanitary Fittings; Bedding; Boarding; Elephant Ride; Guide Service.

**FOREMOST PARK IN THE COUNTRY WITH MAXIMUM
COMFORTS AND VARIETY OF WILD LIFE**

RESERVATIONS:

- (1) **CHIEF WILD LIFE WARDEN,
17, RANA PRATAP MARG, LUCKNOW
PHONE 24434 - GRAM, WILD LIFE**
- (2) **TOURIST OFFICER, U.P. NIWAS
3, KAUTILYA LANE, CHANAKYAPURI, NEW DELHI
PHONE No. 75782, 72806**



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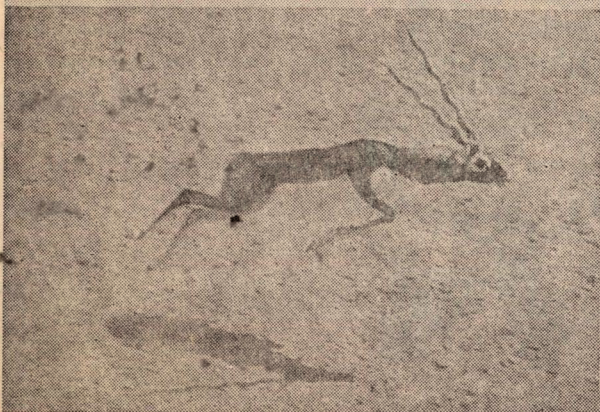
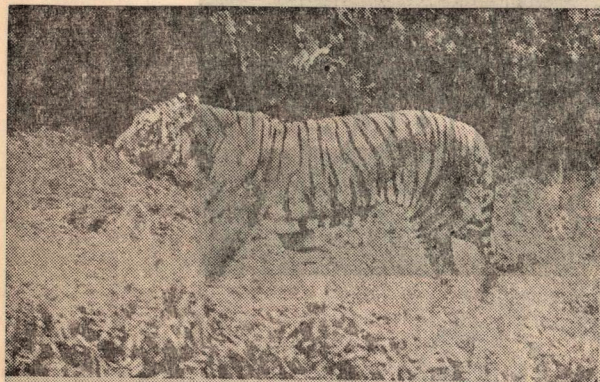
In 37 years we've gone places Like:

New York
London
Delhi
Bombay
Singapore
Sydney
Perth
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Cairo
Moscow
Brussels
Paris
Frankfurt
Prague
Zurich
Geneva
Beirut
Teheran
Kuwait
Bahrain
Calcutta
Madras
Bangkok
Kuala Lumpur
Jakarta
Nandi
Hong Kong
Tokyo
Mauritius
Aden
Nairobi
Addis Ababa
Entebbe
Amsterdam
Dubai



AIR-INDIA

VISIT GAME SANCUTARIS OF RAJASTHAN



- | | | |
|------------------------|---|--|
| 1. GHANA (Bharatpur) | : | Breeding, Bird Sanctuary, Local & Migratory Birds.
D.F.O., Bharatpur (Tel. 388). |
| 2. VANVIHAR (Dholpur) | : | Tiger, Panther, Sambhar, Cheetal, Etc.
Game Warden, Dholpur. |
| 3. SARISKA (Alwar) | : | Tiger, Sambhar, Cheetal, Four-horned, Antelopes.
Game Warden, Sariska (Alwar) (Tel. 5). |
| 4. SAWAI MADHOPAR | : | Tiger & other Wild Animals.
A.C.F., Sawai Madhopur. |
| 5. TALCHAPUR (Bikaner) | : | Black Buck.
D.F.O., Jodhpur (Tel. 792). |
| 6. DARRAH (Kota) | : | Tiger, Cheetal, etc.
Game Warden, Kota. |
| 7. JAISAMAND (Udaipur) | : | A Variety of Wild Animals
Game Warden, Udaipur. |
| 8. MT. ABU (Abu Road) | : | Panthers, Pheasants, etc.
Game Warden, Abu. |

Issued by the Govt. of Rajasthan.

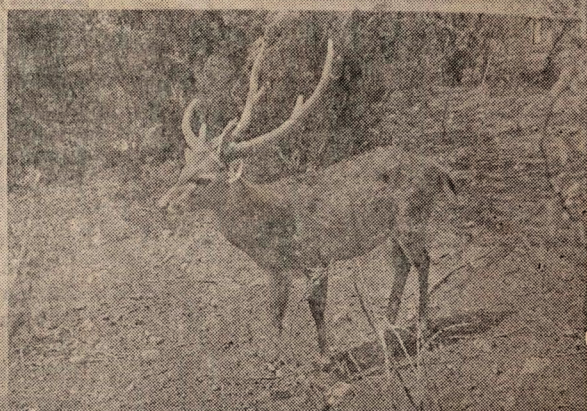
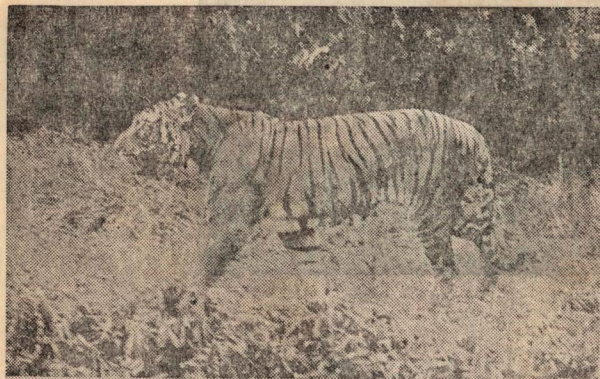
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Geneva
Beirut
Teheran
Kuwait
Bahrain
Calcutta
Madras
Bangkok
Kuala Lumpur
Jakarta
Nandi
Hong Kong
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Wild Life Preservation Society of India

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4. Shri R.D. Singh.
5. Dr. S.K. Sangal.

Tourism is an industry...

the world's biggest

Tourism is much more than an activity that keeps pleasure-travellers pleased. It is a Rs. 11,000 crore world business investment today — roughly twice the size of the oil industry. And investment in tourism earns the most foreign exchange in the shortest time.

Italy alone earned Rs 1000 crores in foreign exchange from tourism last year. And Spain could build two steel plants like Bhilai each year on her tourism earnings alone!

What about India?

It is true that the number of tourists visiting India has greatly increased. From 1,50,000 in 1964 to almost 2,50,000 in 1969. And our earnings from tourism have gone up to Rs. 33 crores in foreign exchange. But in terms of world tourism, only one out of every thousand world travellers visited India last year. Yet we have just about everything in this country to make it the world's most attractive tourist destination. We are privileged we have India.

What's missing here?

We lack nothing but broad-based public participation and enough of what is known as the 'infrastructure': hotel accommodation, transport facilities and tourist amenities. For instance, the city of Bangkok alone has more hotel beds suitable for tourists than we have in India.

And when the Jumbos come...

Jumbo Jets will soon bring past India many thousand more people than have ever come this way.

They will need clean, comfortable accommodation; at least 23,000 more hotel beds are required by 1974. Wholesome, hygienically prepared food, more shops, restaurants, recreation facilities... all these are necessary now. Above all, a smiling, friendly welcome must await our visitors to make their visit a happy one.

What are we doing about it?

The Government is taking an increasingly active part to help build more hotels, improve air and transport services, provide new and better tourist facilities.

But Government effort alone is not enough. Tourism is everybody's business. Because people benefit wherever the tourist travels. Wealth flows from affluent countries to the less affluent, and within the country from the developed areas to the less developed and from the richer strata of society to the less rich. Everyone benefits from tourism.

So, join us in our efforts. Let us give the tourist the amenities he needs and see that he goes home happy. Each happy tourist means so many more will come next year. Shouldn't be too difficult for us. Isn't ours one of the world's oldest traditions in hospitality?

**Welcome a visitor
send back a friend.**

Department of Tourism
Government of India

